**YOUR** 

### **Nick Bark** leaving PEDS

NICK BARK, managing director of Perkin-Elmcr Data Systems' European operation for the past three years, has resigned to become president of European operations for a large US electronics company which is pinnring to break into markets on this side of the Atlantic, The commany is understood to be one of the leaders in the defence murket.

Bark joined Interdnta, as It was then, in 1976 when the European operation had sales of \$7 million a year and a staff of about 60. Sales for the present year are expected to be about \$45 million and UK staff alone totals 200.

#### More disc power

FNHANCING the specifications of the yet to be delivered System 38 dalabase-oriented business computer, IBM has anaounced that up to four of its 570 Mbyte 3370 fixed disc drives can be fitted to the 38/5. Total cost, including adaptor, is £68,207, or £33.50 a Mbyte.

#### Shipping launch

A MONTHLY magazine called Lloyds Shipping Economist with detailed anolyses of world shipping developments was launched this week by Lloyds of London Press. Its contents are largely based on reports generated by Lloyds Digital Equipment PDP-11/70 system at Colchester, from Lloyds' own database on slip movements and from technical data supplied hy Lloyds Register of Shipping.

#### Growing role

SPECIALIST acrvices for Univse's BC7 small business computer are likely to be a growing part of the business of Guardian Computer Services, of Menchester. An approved Univoc software louse, the compnny has installed a 128K BC/7 in its new oremises at St James' House. Pendleton Way, Salford. Manchester 6.

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**ACCESSORIES** 

GLEANER/CERTIFIER PRINTER RIBBONS

# Wyly Corp chairman replaced

Burroughs

regroups for

office of

the future

BURROUGHS is strengthenin

te recources in the electroni

office area, according to

A special Office Autometion

livialon has been set up withtn

the Office Products Group, and a bid has been made for Context

Corp, a privately-owned maker of OCR machines besed in Sur-

lington, Maes.
The Office Autometion Divi

sion will include WP msket

Redectron and fox company

Grophic Sciencon, and will be

mininged by Del Berry, furmer president of Grephic Sciences.

respond to IBM's new 4331 was

Nippon Electric with a new

Called the 77/250, the new

machine falls between the 200,

based on Honeywell Level 02

licences, and the 300, hased on

CII-Honeywell Bull Level 64

licences. It is not clear to which

family tire new machine belongs.

be delivered with 10K memory chips, but will have 64K chips

from next January.

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CRANFIELO is a sampany offering a TOTAL range of aspollar to

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NEC says that it will initially

Key features of the new

machine include new control

processor, communications

controller supporting up to 64

workstations, and a separote

disc controller. A new Codasyl

database called ADBS has also

heen Introduced, together with

Interactive software for online

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product range which covers ALL ments not be manifored cented us, and

model in its Acos-77 line.

beervers in the US.

SAM WYLY, who founded the University Computing Compuny in 1963, has been replaced as chalrmen and chief executive officer of UCC's parent, the Wyly Corp, by John Kason from the UK. Wyly's share in the Dallas, Texas, company was reduced from 11% to 2% last year whea its principal creditor, Careal

Holding of Zurleh, took a controlling interest. Wyly Corp ran into serious financial trouble in 1976 after the collapse of its ambitious microwave-bused data network. Datran.

To avoid having to seek protection under the US bankruptcy laws, Wyly settled its debts with a recapitelisation plan under which creditors were offered 100 shares and \$110 cash for every \$1,000 they were owed. Careal Holding, which had put \$50 million into Datran, ended up with 51% of Wyly Corpstock. Careal's relationship with UCC began in the late Sixties when Coreal's hoss, Walter Hafaer, sold his Zurich-based Automation Center bureau network to

UCC and took a minority share in the Dallas com-

Sam Wyly told Computer Weckly that his only involvement with Wyly Corp now was as an adviser to the company on its \$310 million unti-trust suit against AT&T, the US telecommunications grant. Wyly Corp is charging AT&T with introducing anreasonably low rates for data transmission services in 1974 which made it difficult for Datran to sign new

The other leading Enropean in the Wyly Corp. story, John Kuson, joined DCC when the latter acquired Computer Services (BirmIngham) Ltd in 1967. He rose through the ranks, being elected to the board of the Dallas company in 1974, and was made president last year (CW, March 9, 1978).

UCC says that Rason "saw through" last year's

February Ia).

being acquired.

Thursday, Any negotiations on a

merger are stalled pending

acceptance of these (CW,

"I expect II to take 30 to 60

"We have not yet released our

"The attraction of Mosicoup

1978 figures but they will show

to a potential bldder is that there

are only three independent

minimakers in the industrial

market, and Modcomp has a key

reputation. Anyone wanting to

go into industrial control needs

Maxnet communications soft-

Modcomp is also noted for its

digital LA3-14' Symerfi

L\$130 DECWORECHE

sales of about \$65 million

company like ours."

days," said Glles, "We are now

willing to talk scriously about

# Thorn tipped as Modcomp bidder

Thom is seeking to diversify

ioint venture with Erlesson of

Sweden on private digital

LATEST UK company to ride strongly rejected a widely-the US takeover trail is Thora touted rumour that GEC had Electrical Industries — and the come back for more talks. domestic appliance and consumer electronics ginnt is into the microprocessor applicastrongly tipped as one of two tions and communications multinational companies bid-fields, and already has a UK

ding for Modcomp. The new president of Mod. comp. Alexander Giles, declined to comment on suggestions that either Thorn or Gould was int-

the machine a competitor for the

IBM System 3g as well as the

The 4300s have not yet been

antiounced in Japan, and

government is trying to persu-

FIRST off the blocks in Japan to program development, making

tclephone exchanges. Although Modcomp does not precisely fit the profile of the company Thora is seeking, and crested in his company, but Thorn would acither confirm Nippon introduces new Acos nor deny its interest, sources indicate that not only is Thorn bidding but that it is the frontin response to the 4300s

The other multinational company interested in Modcomp is likely to be Northern Telecom of Canada

Thorn has announced that it has conducted studies in the microelectronies field with a view to making acquisitions in observers believe that the the US and Europe, ond sources sny that it has independently ade IBM not to price then too Identified several US companies competitively, lest they drive the already studied by GEC as posindigenous mnnufacturers out sible acquisition candidates. of the low-cnd mainframe mar-

GEC held abortive puriucquisition talks with Modcomp last your, and was thought to have reopened negotiations (CW, January 11).

Speaking from Modeomp's Fort Lauderdale, Florida headquarters, Glies told Computer submitted revised accounts for 1973 to 1078 to the US Securities

AS o result of expanalon in business, the Neili Group of engineering and tool companies is Weekly that the minimaker to replace its Univac 1106 with 512K 1100/g0 system.

### Expanding

### Police drop 'suspect' plan

THE controversial plan for a Civil Libertles because it was national network of police com- used to store whot is said to be puters holding "intelligence" on hearsay about the characterissuspects rather than hard facts tics of named individuals.

been dropped. An experimental system at was made by a committee of Thames Valley Police Head-senior police officers and Home quarters at Kidlington in Office officials headed by Ken Oxfordshire (CW, November 30, Oxford, Chief Constable of Mer-1978) resulted in considerable seyside. He said that the Thames objections from organisationa Valley system had "inherent such as the National Council for dangers,"

'The decision to drop the plan



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said a council spokesman

the courts and police all

cloing is using our proces:

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tion on court cases and his

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power, Thomas Saker, 1

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### Cavenham will switch to 2900

ASSURANCES have been gir THE Allied Suppliers supermarket division of Sir James Goldshy Doncaster Council he! mith's Cavenbam group is to switch to ICL 2900 and VME/B. proposed sharing of its computer facilities by the be-Currently running a System magistrates' courts and K!

Middlescx computer centre Ailled is to start installing a dua ICI. 2960 system worth £1.6 million, In August, The first processor will replace the 4/50 and be and VME/B.

via ICL 7502 termini par "And while there will be monication over Pone leased lines, the whitebeen approved by the Office. The real coint. has been tight foreast

njigrafied to a 128K Bor-BI 830 system from a 86EL will eventually be applied further talks are planned.

#### Peripheral aid

### Hitachi move

MAPANESE efactronics glant Hischi is looking to Europe as the possible alte of a new discoelectronics foctory. The second control of the second control plant, but the UK, with its stractive government funds,

### Irap feared

BSERVERS suspect a hidden an for plug compatible dipharal vandors and users in a naw IBM policy of supplying erating software for the 4300s. "IPO/Es" matchad to the er's specific configuration ether IPO/Es will recognise ipharals: Printed in Great Britain by G.B. imited Specifical Colchester, COS 31.7, and published by Free Ltd. Dorset House Stanford Street Linear Stanford Street Linear Stanford Street Linear Stanford Street Linear Stanford Street (1) 为一种

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### **Briefing**

#### itelligence computer system was lifted slightly this week when Assistant Commissioner John Wilson listed, on the BBC2 programme Man Ailve, the five categories of information held on the system. Hitherto the Home Office has refused,

which the Prime Minister has

called "uanecessary and unjus-

tifiable", civil servants sceking

nto battle with the government

Wielding the power to

pay increases of up to 30% went

this week in the first major con-

paralyse nationally important

computer centres at short

notice, the Civil and Public

Servents Association and the

Society of Civil and Public Ser-

vants pulled out computer and clerical staff from key sites in-

definitely, in a bid to get a pay settlement before April 1 when

their present wages contract ex-

pires. They want this to be based

on a comparison survey carried

put by the Pay Research Unit

(CW, February 8). There seems little hope of a

quick end to the stoppage. With

a strike fund of over £1 million to

keep their members on full aet

pay, estimatee of how long they

THE need for distributed pro-

cessing software for its U-series

of minicomputare has led

Japanese manufacturer Fulltau

to initiate talka with several

UK-based software houses, in-

cluding CAP, Scicon and Leasco.

Fujitau has its mainframe

communications softwars in

place but needs complementary

system software for distributed

The Fujitsu U-sarles la an or-

iginal design, but has a similar

CSA NEW VENTURES

Spreeding the gospel to UK in-

Fujitsu in talks with

**UK software houses** 

frontation of its kind.

criminals, and their associates. According to Wilson, the categories ere: fruid, from the files of the Fraud Squad;

4/72 and 4/50 at Its Hayes. from the Central Drugs and Illegal Immi-Civil servants used mainly for development

#### DG 32-bit mini

THE 32-bit mini has resurfaced la Data General's plans. After denying last year that the company had plans to enter the 32-bit mini market (CW, February 9. 1978) sealor vice-president Herb Richman has commented in Australia, "You could say that we have not turned our back on 32-bit minis," indicating that the product could appear "in about a

#### 2900 line halted

PRODUCTION of ICL 2900 and System Ten systems at the company's Letchworth and Stevenage manufacturing sites is being affected by a two-weekold unofficial strike by over 1,000 workers who are demanding a 15% pay increase. The company's offer of 5% plus an improved sickness benefit scheme on top of the nationally agreed productivity scheme has already been rejected, and no

TO alleviate the UK's balance of trade deficit in computer perlpherals, special aid should be given to manufacturing of peripherals in the UK, particularly in the areas of big discs and printers, according to the latest progress report of the Neddy mputer Sector Working Parly. The SWP also feels the rnment should push more in the development of standards, emd continues to be worrled about the lack of a co-ordinated Mational scheme for training in he computer industry.

his pot been ruled out.

#### THE vell of secrecy over Scotland Yard's gration and Intelligence Unit); serious crime, from the Serious Crime Squad; and Special Branch files. In the same programme the controller of the Police National Computer at Hendon, in

reaponse to probing from BBC reporter Jenny Conway, admitted that some of the even la answer to Parliamentary questiona, Information held on the PNC was not strictly to say anything more about the machine factual thua that it coatains indices of crime, There is space on records there for officers

show their teeth

as far ahead as three months.

"The Prime Minister has had

the gall to say that we are

striking unnecessarily and he-

fore our contract runs out," said

Gerry Gillman, general secra-

tary of the SCPS, "but the truth

is that government interference

Why we are bringing the govern-ment of the country to a half — See

with pay research has caused

Allstair Graham, deputy

general sccretary of the CPSA

sald, "The government seems to

be concentrating on the con-

frontation aspects of this dis-pute. We would be happy to get

around the table and discuss the

situation, but since our meeting

with Lord Peart there has been a

Contingency plans the

government may try to put into

bus structure to the Digital

Japanese users expact to get

oftware at no cost, which baa

led to software expertise being

manufacturera. There le thare-

fore no independent software and systems Industry compar-

A delegation from the major

Japanese manufacturers will

able with that in Europe.

February 15).

minicomputera linked to its mainframes, acting as either visit the UK in April with a view

node computara or terminals. to establishing UK-Japanese

concentrated in the mainframe

Equipment PDP-11.

the present dispute."

total sllence.

to insert comments such as suspicions about motor vehicles and the like, indicating vehicles and people the police have all Intdrugs; illegal Imalgrants (these last two crest in tracing, he said.

The PNC ostensibly records only criminal

computer engineers, who are

members of ASTMS, have

agreed not to service computers

The first casualty, even before

the national stoppage on Fridny February 23, was the Customs

and Excise installation at

Southend which came to an ale

rupt halt last Thursday. About

£500 million of VAT revenue

week is being blockaded, and on

the other hand, businesses ex-

pecting to get a shere of the normal £100 million a week VAT

**Customs blame agents** 

INCORRECT entries from export and import agents are emerging as

the cause of gross inaccuracies in the 1978 overseas trade figures for

analogue and hybrid computers revealed in Computer Weekly lest

for faulty figures

nt strike-hit contres.

Turn to page 17

month (CW, February 8).

the inaccuracies.

nygria

The Customs, which tabulates

outer Weekly for pointing out

According to the figures, ex-

ports of analogue and hybrid

aata

Turn to page 17:

the figures, has thanked Com-

records, wanted end missing persons, and

ered Labour MP Jo Richardson (Barking) who intends to ask the Home Secretary why she was refused such information in response to a Parliamentary question.

Further to last week's report that plens for a nationwide police intelligence system have been dropped (CW, February 22), the Home Office has denied that any such plans existed. It affirms, however, that the Thames Valley experimental intelligence system is to continue in operation for another year.

Roberts -



DEREK ROBERTS In to leave Pleasey at the end of April, and will be joining GEC as director of rosearch, and head of the Hirst Research Centro, Wembley, one of the fargest elec-trical and electronic laboratories

in the UK.

In his now position, he will ceport to Robort Clayton, tachnical director of GEC, and chairman of the new GEC-Fairchild somiconductor com-

At Pleaney, an divisional managing director and chaluman of Pleasey Microsystems and Pleasey Samiconductors, he was responsible for Plassoy's own research efforts at the Allen Clark Research Centre at Coswell, Northants.

CLOSING date for Computer

# What Scotland Yard holds on intelligence system Burroughs vehicle ownership. Wilson's revelations on televialon were will an indiscretion, and have ang-

FIRST US mainframer off the mark with new models specifically priced and configured to meet competition with IBM's 4300 line is Burroughs and one of the new machines sets up a nuarbering clash with ICL's 2900 line.

The new muchines are the first models in Burroughs' new generation "900" family and full into the medium scale range, replacing B2800 and B3800

Announced in the US last Fridny and set for April launch In the UK, the new muchines are the B2930 and the B3950.

The B2930 bas a starting price of \$140,000 including the MCP operating system, and comes with 512k or 1M-byte of main memory. Burroughs says that it is twice as powerful as the 2800 model it replaces, and 30% cheaper. It is also slightly more expensive than the IBM 4331 but claimed to be more power

The 3950 has main memory renging from 2 Megabytes to 5 Megabytes, offers three times the power of the 3800 model it replaces for the same price, and at a starting price of \$230,000 is a little cheaper than the IBM 4341.

#### Star entry

ters 79 is March 10, so don't miss the chence of entering your teams. An entry form is on page 17 and full conditions of entry ware published in Computer Weekly on Fabruary 15.



JOB OPPORTUNITIES: PAGES 20-63

COMPUTER WEEKLY'S INSIDE NEWS Computing in schools
Cheque image processing
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CLEAR retrostate ( steel 8.5 pany, well-established in the UK, which has greated this new post to cope with an expanding market. The successful applicant will be based in Leeds and be responsible Spreading the gospel to UK in-dustry shout word processing pro-moting the training of computer staff, tackling the problem of soft-ware copyright, and working with overseas bodies on problems of regulation are all among the new ventures of the Computing Ser-vices Association, Rory Johnston reports

North. This is one of many jeb opportunities presented in a special Northern reguliting feature.

Pages 32/38

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- TABULARELS

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bids to sweep

puter UK Ltd. Called Large

Scale Hapas, the system is con-

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New York: 205 East 42nd Street, New NY 10017 Tel [212; 867 2080 Telo- 421710 Published weekly on Thursday

Regulared at the Post Office as a newspaper Price per copy 18p IPC Business Press Ltd 1078

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Production Oovid Abbay Computer Weakly has a circulalise as: week of ever \$2,000 including the high-est tuby requested of culation in the UK The informational addition, which is

published 16 times a year has a circula lise of ever 94,000.

hasn't aiready been triad

#### WITH British management coming under Princely scrutiny last week, a look at the style of management in one of our most successful trading competitors, Japan, seems timely. We have all read about blissfully happy employees, the

concept of employment in one company for life, and the fact that apparently nobody ever gets laid off by a big company. regardless of how much production is automated. At worst, surplus employees end up doing socially useful things like sweeping the lawns outside the

Who are the managers responsible for the apparently highly dealrable at ate of affaira n Japanese industry?

First of all, as likely ua not, they are engineers. In Japaneae society, wedded to atatua, engineers come near the top of the tree. According to John Prentice, Counsellor for Science and Technology in Tokyo for the paat three years, a good 60 per cent of top managers in Japan are engineers - and engineers are typically paid 10 per cant more than their peers in profes-

sions like Law. One of the major problems in the UK appears to be that individuals become too indispensable too early in their careers so vitai in one particular role that time speat on acquiring experience of a broadening rather than a specialist nature cannot be economically jus-

ACCORDING to e recent cor-

respondent (Lettera, February B)

the real world of computing is

situated on the user's desk or

workbench. The mlero revolu-

tion is well and truly esteblished.

From the periphery of the in-

dustry, this moy well be the

view. The industry appears to

have little time or regard for the

mainframe - or even last year's

super wonder, the minicom-

puter. Exhibitions featuring tha

Hardiy had last month's Micro-

systems 79 closed than the naxt

micro falr was being promoted.

ripping over micro exhibitions

For once, the government is

is becoming an occupational

not lagging in adopting the new technology. It could well take a

whole battery of micros just to

icroprocessor ere all the rage.

# A lesson in management from Japan

haps personnel management, or

he may return to his specialisa-

tion, at which point, after a

refresher course, he will he

regarded as someone well fitted

as a result of his time "off the

job"; on the contrary he will be more highly regarded for it.

At the age of obout 35, he will

afford to "waste" key people in

rigours of pay restraint and the

temptations put in the way of

He will have lost no seniority

to head a development effort.

management.

In Japan, this does not appear onother interim posting, per to be the case at all. On the contrary, once a potential high flyer has achieved a basic grounding and done some useful work in his specialisation typically four years at university, six months additional training with the company and then four yeara "on the job" he is transferred to something totally different.

Thus a software engineer working for, say, Hitachi or Nippon Electric may go into soles for three or four years at the age of about 27. Or he could become the company's overseas representative in a strategic post like New York or Frankfurt, monitoring the local computer industry and Presa for his employer back in Tokyo, and providing insights into his company's business to anyone inter-

After that, he may go into

top staff to entice them into

another compuny.

The need for new challenges and new surrunndings is one of the factors which sways people to make such a move and this, at least, canid be provided by glving key people extended experience of other parts of the

This is not tu suy that training programmes in British companies do not frequently give individuals a taste of various purts of the business in their earliest years. But it is only during the enriest years, and it is typically nu more than six months in sales or production.

The key difference is that in Japan this continues much longer into an individual's career, and the periods in different occupations are for three or four years - long enough for the embryo manager to do an effective job, rather than simply see how it is done.

The negative side of the Japanese system is summed up in the fact that they are typically learn whether he is morked out innovative only in applying for the very top, or whether he technology imported from the will spend the rest of his career US and Europe, and that new in the lower echelons of small, high technology com-We say that we could not panies are much less likely to be formed by disgruntled individuals who feel they know posts not directly related to their hetter than their big company expensive training and hardwon experience. And yet typically these key people are

For example, Japanese visltors look in amazement at the soon lost to the company which array of highly innovative soft-"ean't spare then," through the ware and systems houses in the UK and say they have nothing like that in Japan.

On the other hand, Japan still has five mojor mainframe manufacturers while Europe, almost three times as large, has mlv 252.

And wouldn't it he snittnry for all those creotive designers in enmponies like ICL tu have to go out some time and actually try pri told Computer Well to sell the machines they had no approval for such 1.8

### Watch of for the Bogle Sty

II yuu live in Lancashpes forget to look out in suic the walkers in the annuit.
Stroll this weekend This is organised by the suden;
UMIST as part of the Mucster and Saliord Rag responsored by Computer Wis
Ench year about 3000 mienter and Ragio 20

enter and Bogle 79 is to to ruise shout £18,000 fet charities. The walkers start the Ha-

trek at the UMIST campaid 11.30 pm this Friday Ir Manchester the route take; walkers to Worseley, Albert Wigan, and then some Standish, Chorley, returning UMIST via Black Reis winton. The first walker he nected home at 7 pm. To help process details of

teams a batch system and will be used on the University Munchcater Regional Cong. Centre.

During the walk ten Cardore Pets will be med the minals at the checkpoints. to a CTL MOD I computer UMIST. This system is into provide communications ween all checkpoint and trol the use of vass, beer marshals.

All the walkers me weuring o large while st with the word "bopt" at. "goblin" motif printer: lugether with "Con: Weekly."

#### French viewday DESPITE firm Indicates

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**TERMINALS** 

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several sources the husiness consortium establish a privile UK Presiel system, the had been sought.

### Time runs out for Freedom of Information Bill THE Committee Stage of Clement Freud'a bean defeated in the Committee, which concerned that it does not give enough

week, leaving supporters with the task of supporters. mons for Report Stage on April 8. About five hours will be available for it on that Friday - not nearly enough for consideration of the Bill's 40 clauses.

Both front benches appear more determined that the Bill shall not go through, so It will he difficult to persuade them to give up

The Bill is as yet in more or less its original

Freedom of Information Bill finished last contained a sizeable number of Freud's

through an MP as at present, not directly as had been proposed.

It is expected that the government will introduce mojor amendments at Reports Stage that may cancel out the central pur-

The First Division Association, the trade union for top civil servants, has announced fonn, most government amendments having that it is not opposed to the Bill, but Is

protection from exposure to "intragovernmental communications". These trying to get more debating time allocated to

One change that was made, however, was

It when it returns to the floor of the Comthat appeals to the Ombudsmon over the

Would, be advice given by civil servants to
Ministers about contentious policy issues. operation of the Act would have to go and the FDA feels it is essential to be able to keep these secret, as is done in other countries that already have Freedom of Informa-

tion Aets. The Association says that, should the Bill become law, its members will seek to implement it as effectively as possible, but there is concern over the "additional administrative burden" that will orise. This needs to be

dynamic memory is seen as un

the same pin-out as the 64K part.

With its fast access time of

sees the part being designed into

volume production in 1981.

operating as slaves. These are around 80 nanoseconds, Intel

figured round Digital Equipment hardware and includes a novel intelligent terminal de-signated the VT103. Established in Briebane in 1974 specifically to develop accountency systems. Hartley

Computer has enjoyed considerable success with its Hapaa In Auatralia, an estimoted three out of every four accountancy practices are said to be

Hapas users. There are nearly users worldwide, including 25 in the UK whera the company this year, the new 2118, 18K began trading last August.

Nearly all of these are single single-board computer system essential precursor. It operates user systems, bullt round the aimed at the OEM market. Using on a single 5V supply, giving it Wang 2200 series.

Like this system, Large Scale Hapus fentures a word processing capability for producing standard reports and also uses systems as a stoppap for the 64K character-by-character input memory, which should hit checking. It is based on a PDPchecking. It is based on a PDP-11/03 central processor, suppor-

accountancy market A MULTI-USER ternkey system tlng up to six VT103 workstafor accuuntancy practices has been launched by Hartley Com-

A stendard VT100 modified by incorporating a 64K LSI-11, the V7103 is quite similar to DEC's PDT-II terminal, but has a communications greater capability, transferring data at up to 38,000 ehps.

A minimum Hapas system costs just under £9,000, while the smallest multi-user (with one terminal) starts at £18.950 Extra workstations are priced at between £3,500 and £4,000.

#### **IBM 3033** pricing

PRICING on iBM's new 3033 Attached Processor has been clarified by the company (CW February 15). To upgrade from u uniprocessor, a conversion cos-ting £3,517 is required. The 3038 multiprocessor communication unit required for the attached processor costs £235,900. The second processor, called the 3042 costs £571,070. A second consple costing £93,000 is aiso needed, as is a power distribution unit costing £99,200.

### Bigger Intel extends its and earlier range of systems Compec

and interface systems.

The second introduction is n

an 8085 as the CPU, it also in-

clades three other processors

8741 universal peripheral con-

trollers which not us peripheral

With its 64K RAM scheduled

front-ends to the CPU.

THE overwheiming success of Compoc lest December, when sitendence doubted to nearly further into the systems market, Intel has introduced two new 29,000, means a further onlar products this week that extend gament for 1979.
All the illms that wanted to its eapabilities in this area. A third innovation is a 16K dynumle RAM that is a preeur-

calible could not be accommodated, and Otympie's National Hall was crowded with visitors throughout the event,
So Compac 78 is moving to the larger Grand Hall at Olympia.

Olympia. Originally, tito National Hall

had been re-hooked for rise same time, in Occombor, but the move into the larger half clas Involves a move of date.
Compec 79 will now be held on November 6, 7 and 8.
"Sy the close of the 1670"

how, spees bookings were llooding in at such a rate that we know we would have to think again," says liffs Promotions, which organises Compac on bohalf of the eponsore, who in clade Computer Waskly, Deta Processing, Systems Intern-

stionel, Electronies Weakly, Ejectron, and Microsystems.

"Without doubt, Compac is now British's finest and most important axhibition of computers, systems, peripherals and software. The enlargement will provide more space for both as histors and visitors, and Compact will read the systems. Compec will remain at Olympia for the foreseeable future." Exhibitors have been told of the change, and of the fact that

previously-announced charges

or stands and space will remain

#### No conflict on bank terminals

sur to the company's entry lato

the 64K RAM ruce, later this

Systems sules already account

for some 50% of Intel's annual

sales, and the new systems pro-

ducts are expected to help ex-

uand this sector. The main in-

trol system, known as iCS-80.

troduction is an industrial con-

In essence, this is a chassis

racking system equipped with Intel's standard Multibus hus

structure as the bnekniane. Into

it can be plugged any circuit

bound from the company's range

of single-bourd computer sys-

tems, which include not only

NO coafflet is expected between Plessey and Univac over marketing of the Bunker Ramo System 90 line of banking terminals. As exclusively reported (CW, November 23, 1978) Univacis to market the Bunker Ramo System 90 line to its mainframe customers in the banking world, including the UK. Plessey will market the terminels to all other

### EMI wins first overseas royalty for CAT scanner

NEARLY three years after the already made by Ohio-Nuclear, beginning of its legal battles over patent infringement in the US. EMI has been paid its first overseas royalty of \$15 million for the CAT medical diagnostic

The payment was by Johnson and Johnson which has just acquired the Technicare Corp. Ohio-Nuclear, a subsidiary of Technicare, manufacturea and markats CAT scanners, and EMI egainst the former in July 1978 and February 1978.

and half will be entered as future sales are made.

EMI also has sulta pending against Pfizar and the US Ganeral Electric Company, and hopas that the payment by Johnson and Johnson will encouraga the other two companies also to settle out of court.

The American GE is developing the scanner as an industrial inspection davice, with an filed patent Infringement suits application which scans components of jet engines to find flaws in the matal, EMI says that Half the payment will be entstred in EMI'a accounts for tha

cipla of CAT scenning, industrial current year, as royalty for sales Inspection ia elso covared.

### lalisman start delayed

संचित्रं म

the last level of the Talisman settlement aystem at the Stock exchange have put back two weeks the date it is scheduled to complation of programming festing had to be dalayad until

MOORERED L'CO, LTD.

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Tha SE Council met last week to discuss letters from members about the acale of charges fo

isman (CW, Februery 15).

WORD processing software capeble of handling diagrams of chemical structures has been introduced by Vydec for ite screen word processors.

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BASIC as standard, \$2959.00 + VAI. (FORTRAN and COBOL available as extras.) Alt dealer enquiries direct to Abacus Computers Limited

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Casternik Glasgow

PO Box 24 Northwich Chesnie CW8 1R9 Te: 0605 75627

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### 1984 and all that . . . .

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281 601

261 861

THIS week's example of the funny things people say in the media £5. The cutting is from the latters page of the Waskiy News.

The standard of referening leaves a lot to be desired. So what to do that

hazard.

in this electronic ege, it shouldn't be beyond the experts to device a competer, programmed to accept signals from ministure TV campres positioned strategically around the pitch so that all engles are covered.

These would produce & cleer platers of any unfair incident. The sompute would send out a short, strident wall. Play would atop imme

A computer controller, who would, in effect, he replecing the referee end be seated high in the stand, would make a verbal onnouncement of the offence. — A. HILDER, St Leonerde (£3 letter). ● What a fantactic ideal Next stap, of source, would be to have robots as pleyare — although come to think of it, many are elready pleying like robots (Editorial comment).

DIGITAL MICROSYSTEMS LOW COST RELIABLE COMPUTERS

30 AT. JOHN'S ROAD TUNBRIDGE WELLS (0892) 38691 locata IF YOU SELL COMPUTERS a' Twin Ri' duka — Helf's Magabysa partide a' Add-on Hard disk — up to 28 Magabysa par drive a' CP/M or Musi User Operating Systems a BASIC COBOL FORTRAM PARCAL

has recently announced the satting up of a survay on the impact of the microprocessor. Fol-

No need to fear this revolution

micro bandwagon, The IDPM lowing o successful Micro Forum held in associetion with Computer Weekly, the IDPM is forming a micro business usera'

As yet, there does not seem to be much alarm and despondency raging in the DP installation. Pickets, secondary or otherwise, have not been seen lobbying Commodore Pets or Personal Computing Apples. Deputations have as yet to march on NCC,

Inmos nr Insac.
The reason for this mesterly indifference is, in fact, the realisation by DP professionalathat they ere in a different ball-game. The micro is in no way about to dominate or take over the computer installation.

to the mainframe, not en anta-. that the assorted assault of the gonist. Far from the mainframe micro, word processing systems stranded high and dry in their threat to the esteblished instalinataliationa, medium and large-scale computing is in a healthy

Industry foreceats auggest for larga-ecale computars la

growing by 17 per cent e year.
The international merketplace is public funds being doneted to The various industry bodies likewise booming with industry are also clambering abound the glents reporting record revenues.

Applee mey be thick on the ground, but try ordering the new IBM 4300s - delivary will be from next year's crop.

iBM-compatible mainframe menufacturers are aqually eminent. Itel, Amdahl and tho latest Japanesa entranta ere expanding fast. Last month, Control Data introduced a new machine, Cyber 203, which it is cialmed can provide a hundred million calculotions in a single second. Try that on your micru!

Development is not limited to mips technology. Memory atorage devices, all aimed at tha iucrative IBM-compatible market, are being developed using electronic beam memories, thin film heads and charge-coupled technology. It may be fashlonable to suggest the imminent uter installation. demise of the mainframe. But it is based on a false assumption ueezad out and laft end distributed processing are a

The micro revolution may be taking piece. But it is a movement which assists rather than that the European merketplace conflicts with the real world of

# Ten years ago...

COMPUTER WEEKLY

GREYHOUND Competer Corp shopped up the Management Dynamics computer bures of from Brooks Bend Liebig for £2 1/2 million in cash. The pay and personnel records of over 100,000 RAF, similar and anyonet were being handlad on a University being handlad on a University being handlad and which was claimed at the letter and most side and which was claimed at the letter and most side and records.

**FEBRUARY 27, 1989** 

and Development Corp was to back a research project at Essax University for the development of an interactive terminal for use in hospitals. Software File started with a report that multi-access systems took up a lot of core and how fCL got round this with its Multimop system. Philips Electrologica Lett the UK subsidiary of Philips Industries, launched the RSEO gerias of office computers. ent Corp was

digital digital dloitat digital Modules supplied ex-stock

(Naw Bi-directional 180 eps terminal) From £1693 LA180 DECprinter I From £1575 Newbury Labs' latest range of British Will From £49) IMMEDIATE DELIVERY OF 7000, 7000 7009 AND VT52 EMULATOR ON 7009 AVAILABLE NOWI From T.O. SYSTEMS DEC. LSI 11/2 PRODUCTS

DELAYS in the progremming of the next period, from March 5.

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Talisman and decided to dafar 8. According to the SE the until July when the system came too close to the start of the current fortnightly SE dealing stocks will be hendled by Tails man. The Council has elreedy should be in full operation. By conceded that a reduction in the SE's general service charge to mambara could be made to compansate for the cost of Tal-

MP software

Tesco bureau offers

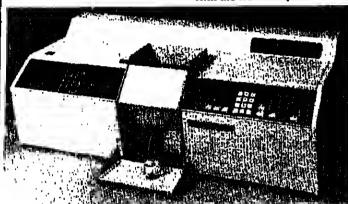
### The gentle art of obfuscation

A READER, G. A. R. Taylor, three weeks ago was inveighing on our letters page against Jargon in computing -a futile task, i'm afraid. Prompted by this, Nick Bell of BICC has sent in a couple of glorious pieces of obfuscation,

Each library list contains a number of catalogued entities, also known as library (Iste, each of which contains a list of libraries that may be added to the library list. (VME/B Bystem Construction and Maintenance

Still we cannot claim that computer people have monopoly on labyrinthine prose. I don't think anything will ever beat the celebrated Admiralty minute: It is vital for sefety reasons that

these werfloads be stored will the top at the bottom and the bottom at the top. In order than there may be no doubt se to which is the top and which is the bottom for eterege purposes, the bottom of each wer-head will be clearly labelled with the word "Top."



This lo Varian's lotest micro-controlled etomic absorption spectrophetometer. Se new you knew. It's nice to see that even such wonderful mechines as this, when pridergoing diagnools, lieve to

### Liverpool chips in

DESPITE the vicw of all stick-in-the-muds, our city fathers seem far from slow in taking up the cause of new icchnology. Only a year ago most of them would have said that California's main export is celluloid rather than silicon, and yei here they all sre squabbling in a most unseemly fashion over who is to get

I see in the Telegraph that Liverpool is now calling itself Sillcon City, which I presume will lead to some protest from Bristol. Perhaps we will have Buttles of the Chips, with teama from rival areas huriing aharpen the pina on a whetrounding up stray electronics seen better days.

engineera who stlll misguidforeigners that we Britons are edly want to stay in the

There has been a heated

correspondence in the Liverpool Echo over whether effort should be spent on Saving the Lyceum, a relic of bygone days, or whether the time should be apent trying to attract the microelectronics battailons. One writer insisted that international whizz-kida would go to Bristol because amenitles ware better there, and therefore the Lyceum is vitai to Liverpooi's future. I like the idea of our supertechnocrats changing thair minds over 40-pln packages at one another. Will it be cheating to cause of one building which, I understand from a colleagua. Is stone? Then there'll be press a faded Victorian clubhouse gangs roaming the streets, that it is painfully obvious has

### WHAT PRICE PRIVACY

Wednasday, 11 April, 1979 The Instituta of Marine Engineera Confarance Centre Mark Lane

London EC3

What will the privacy recommendations cost you?

If the recommendations of the Qata Protection Committee become law every computer user will have to make some changes to his systems.

These changes could be costly and disruptive unless thaty are enticlosized.

NCC a saminer "Whel Price Privacy" will tell you what it means and how to implement the changes with the minimum disturbance.

A one-day seminar for computer professionals, auditors end others involved in privacy matters. Registration fee — £72.90 (NCC members) and £81.00 (non NCC members).



Sombar Bookings: The National Computing Centra Ltd.
Oxford Road 061-228 6383

A centrel policy is needed to cover computer education, says David Pegg, a master at Bedford School. Here he sets out severel principles which should be

applied in developing such a policy, and by wey of provoking argument, offers ten proposals. These proposals, he says, would cost a lot of money; but would make the best use of the the fund of experiese that alter exists in schools in this count The author is a member of Schools Committee of the Re

By

DAVID

PEGG

computers to assist learning

for this purpose.

of proposing technological

1. The National Comme

Centre should be givented

of encouraging me.

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Council and the Council

Liducation Technology

particular references

and software develor

5. The Hrldsh C.

d. An advisory centre

should be set up lo 301

centre for information. cirilination, and initiation

evaluation of projects.
7. A special priority is not

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colleges of further education of Education o

Science should take an act

ride lu this.

8. The Department should be a locality of the positive steps to encourage the positive steps to complete the complete of complete the complete

LEAS to do more on completed ucution, to advise them it

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9. i.ocal educational con

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us far as passible, already availeble in the further education.

should be to run les

courses for teachers in

In-house microcomputed

of teachers should in

to teachers by

# A ten-point plan for feeding the hungry sheep...

"The hungry sheep look up ond ore not fed . . . . But that two-honded engine at the door, Stonda ready to smite once, and smite once more.'

Milton had a vision of the pawer mainframes. in towns and rural of the binary computer. But the areas there are more modest fact remains that we now have a system once-for-all chance to teach people of all sgea about that power and how to use it. At last the government is ready to feed the hungry sheep, with the eld of

What proportion of this vast sum will be apent on computer education in schools is not yet clear. But how will it be spent? Will it be largely wasted, in common with many other disburse-

Firstly, let me make clear what I understand by "computer education". It would be more exact to say "education about, and with the aid of, information technology", if il were not such a mouthful. There are three main sub-ilivisions: Learning how to live with the new technology; learning skills in the development and applications of devices and systama, end hernessing information technology to ald education generally.

The first epplies to everyone and extends to such subjects es the use of increased lessure and the need for continued education throughout life. The second relatea to the need to produce e skilled forca of designers and techniciana. The third is concerned with s radical reshaping

of education methods. A central policy is needed to cover the three groups. So far this has not, for e variety of reasons, emerged. Warnings were given at the 1970 iFIP Conference in Amsterdam, but they were largely unheeded, in 1971 (Computer Weekly, June 17, 1971) it was prophasied that tha fellure of politiciana to give adequate support to computer education might wall prove to be a prescription for Luddiam in the

Since then much pressure has been applied from below with very little positive ection axcept n computer aida to learning. But the feilure of politicians is only a dislike of computers in society.

be black if there were not many teachers with pienty of experience in running courses on computers and how to use them. The growth of microelectronica has sparked off tremandous interest in schools. Many would ilke to have their own computer and quite a few have aiready bought them.

A branch of the Computar

Education Group called MUSE (Minicomputer Users in Secondary Education) has expanded almost ten-fold in the last two years, its purpose is to help schools and colleges to use small computers (minis and micros) effectivaly. It holds meetings throughout the country to give advice and to exchange ex-periences on herdware, soft-

iT IS fanciful to suppase that casea microcomputers) linked to

Millon, Lycidos.

But there are many areas where little or nothing is being done because the LEAs do not have go-ahead advisers, and there are no experienced teachers in the schools.

Within schools themselves the great majority of teachers regard the computer as an un-welcome interloper. Higher authoritles have little knowledge uf where, or how much, teaching is being carried out. One urgent requirement is a country-wide survey on this matter.

What then can we learn from the above observations? First, that there is more knowledge of what is needed at the grassrools than among higher nuihorlties. Secondly, that there is little communication between . these two. Thirdly, that the resources avellable and the educational needs differ widely both geographically and in types of schools (of different sizea and ege-groups).

ordination. The latter gives economy of effort, proling of nformation, avoidance of repeated mistakes, economics of size and provision of the best. Decentralisation, however, encourages individualism, variety, versatility and initiative and avoids rigidity, hureaneracy and

over-complication. A judicious

advantages of decentralised or-

ganic growth agulast those of

centralised control and co-

Society should more blemling of the two is therefore work, and advise the t. required.
The Open University has alone concerned when it cons. remarkable work in using comthut urgeni action sneeds puters in education, its exremputer education in st perience enuli be harnessed to

One mistake would be to equip very quickly n large number of schools with their own microcomputers, regerdless of the leck of experience of the teachers in some of these schools. This may soon be happening anywey In default of a policy, because percut-teacher associations are increasingly buying nilcros for their schools.

Abova all, there is need for u the development of software great increase in initial and inservice teacher-training for computar aducation. This should apply to all teachers. If almost every child should be given soma contact with microtechnology, ao should almost very teacher.

When it comes to taking decisions on how to spend the promised millions, the government should take into account the knowledge acquired by taachers must also be opportunitles for

With developments in chaap mass storage, many schools in 10 yeers' tima will have their own distributed systams. Ohiy by trying different methods now will we achiave the best results.

But there are many possible pitfalls. One mistake would be to aquip vary quickly a large number of schools with their own microcomputers, regardless of the lack of experience of tha teachars in some of thesa schools. This may soon be hap-pening anyway in default of a ilcy, because parent-teacher associations are increasingly buying micros for their schools. Another plucil would be to

advice and to exchange experiences on herdware, soft-networks using highly can-ware, teaching methods and trailed software packages decreases of computers.

This is merely the tip of a larga learning. The costs would be iceberg in the major cities large, unacceptably high, and the native developed educations value limited.

The trail need is to balance tasks of encouraging the use of tasks of encouraging tasks of t build very large educationel

packinges, ulthough it inlight not be fonsible to form the equivalent of the Open Itniversity for schouls use, However, the infrastructure of large-scule software and some limited usa of computer natworks would provide valuable economies. The decision on what to use und how to organiae the work wiluid be left to schools and local author-

It is not my intention to auggest how the money shruid be reflection of the ignorance and over the last 10 years. There est how the money should be spent, but to proposo principles based. Howevar, to provoke argument (and it la only from closely reasoned argument that worthwhila decisiona wiil

amerge) i will give a few concrete proposale on how the policy might be developed.

1. There should be a central council for schools education in information technology. informatioo technology, conslating of government officials. busineaamen, educationiata, in universities in tredes union officials, politicians iocai computer elements. and others. This body ahouid tres advice the government on the ganeral policy to be adopted, on how the money should be allocated and on how the work in paragrephs 2, 3, 4 end 5 should

be split up.

2. The Schools Council should

# Midland soon to try out cheque image processing

major revolution in UK banking technology has been started by the Midinad Bank, which has announced that it will begin experimental cheque image pro-

cessing later this year. Cheque image transmission networks could eliminate much of the huge cheque handling and sorting warkload currently borne by UK banks.

The Midland is working with Burroughs on the project, and their co-operation should paralhel fairly closely the joint deve-iopment of the Bancr cheque image system in the US by NCR and the Bank of Americo (CW,

#### --Alternativeto EFTS

CHEQUE Image networks could attenuative to the completely peporless Electronic Funds Transfer System, EFTS, concept where bank accounts era dabited directly from point of sale and other transaction tormorals.

minals.

NCR is distinctly cool on the pura EFTS concept these days, racognising that bank customars and traders hove no sarious objection to writing end handling choques, aven Though benks do not like having to sort and clear them using existing

methods.
Choque image notworks will clow cheques to carry on being used, and will enable the maneger of a bank branch on which a cheque is drewn to varify the signature on it in the time-honoured fashlon. The enty difference is that he will inspect on image of the chaque inclass of the chaque itself.

Teletype 43

the way of the manufacturer that produces the better system ia potentially enormous. The importance of the development to Burroughs is underlined by the fact that the

Burroughs and NCR nre both

extremely reluctant to reveal the technical details af their res-

pective systems, presumably be-

cause the business that could go

Midland is dealing directly with Burroughs in the US. A spokesman for the Midland Bank research development in Sheffield told Computer Weekiy that Burraughs and tha Midland were attempting to solve the sume problems as NCR and the

> rechnologies they were using were similar. But he stressed that there was no direct contoct between the two projects. Both systema will involve some form of cheque scanner nt cuch hank branch, and problems to he overcome in the ilevelop-

ment of both systems include

Bank of America, and that the

Study of UK industry's 'failure' FAILURE of British Industry to new processes in manufactake up new technology, specifically microprocessors, is turing, in the view of the Institute, and this study aims to find out why, in the fleld of microelectronics particularly,

to be the subject of a study by the Independent Policy Studies Institute, Chairman of the study steering committee is Sir Charles Curter, whose committee of Inquiry Into the Post Office produced the controverslal Carter Report, and the institute aims tu get severul other eminent people to join him.

The UK is consistently less successful than its industrial competitors in incorporating

cessible data from the graphical ond pictorial information that makes up the rest of the cheque

Most importantly, techniques for complex sorting of cheque images will have to be perfected before the existing mechonical sorting of paper cheques can be made obaclete. The Midland expects to install

THE Midisad Bank recognises that if a national chaque image claaring natwork is ever to bacome a reality all the major clearing banks will have to work together and accept atendards in the way that they co-operated in the davelopment of the magnetic tak cherocter recognition technotak cherocter recognition technology currently used in mechanics

netionel cheque image network before the US, because the UK banking market is dominated by four large clearing banks while

with the objective of lafluencing

tames Northcote, a senior fel-

low at the institute, who will run

the project day to day, de-

scribes the opproach tube taken

as consisting of case studies of

individual firms, to discover the

phstacles to change and the ad-

vaniages that can necrue. Some

firms that are notably successful

government policy.

que scanning system at one of its area officea within the next six

One of the moin alms of the experiment will be to establish how easily the equipment could be used by non-technical bank staff in a bronch environment.

The system will operate in parallel with existing cheque

#### -Co-operation needed the US has thousands of banks

heque corting. The UK is likely to have

each confined to one State and most of them very small. The Bank of America is oxcap Ilonal in that it can justify a cheque image network for clearing dominates the banking business in California, it is believed to be

The Midisnd Benk elso be liavee that it could justify a chaque image network for transmitting images balween its ewi

able hodies, which the institute

is now starting to canvass.

he biggest bank in the world.

the 4300s, or as well as soma that have fallen This detailed approach is the institute's speciality, in contrast with other research bodies that

concentrate on macroeconomic effects, looking at broad statisnetwork supporting about lies from on economist's point uf view. Several industries will be 10,000 terminals to be installed throughout the UK during the covered, but only the aspect of next 10 years. Of these nhout applications of microprocessors. Money for the study, about 8,000 will be point-of-sale units. £100,000 will come from charlt-

#### ICL to IBM conversion service SUPERMARKET group Tesco Installed in depots at Milton Keynes, Crick and at the group's Cheshunt HQ ready for the start of the SNA network in the lote

has set up a bureau company, Teaco Management Services, vhich is offering a apeciolised ICL to IBM conversion service. This is based on the know-how acquired while about 700 ICL programs, mainly in Cobol, have been converted for running on the group's 6 Mbyte iBM 3032.

Tesco, a prestigious ICL customer, begon moving to iBM hardware when the 3032 was installed last July, backed up by a 102,000 Mbyte 3550 mass atorage system (CW, August

Plans to add o 3031 to the aystem have been cancelled while a wide range of options is considered. DP director Borry Gmnge snid the possible combinations Includeil a 303X, one or more of

gall something from the expected H series due in obout n vear a time. Another option is to front-end the 3032 with n 4300. The finol choice, snys Grnnge, could depend a great deel on IBM pricing policies which could be affected by the advent of the H nuchines.

Tesco has some detailed long-term plans including nn SNA

Already three Computer Automotion Syfa minis (CW)

summer. A 3660 supermarke aystem has been installed at Wellingborough, Northants, and a 3650 PoS system at a Home 'n Weor store in Huntingdon, Both aystems are linked to the 3032 overnight handling of data from the in-store processors. The establishment of the bureau company is part of the

group's overall plan for com-puter use, and in addition to the conversion servica it will scil machine time on the IBM hardware and the three Tesco ICL 1904S systems as they are progressively released from inhouse work as the 3032 takes over, ond offer a quality printing service using two IBM 3800 laser printers. This is backed up by a rms overlny aervice including the production of layouts requlred by hurchu customers.

Responsible for the hurcan operation is fan Bell who has been named bysiness development manager and appointed an executive director of Tesco (see page 10). He told Computer Weekly that for the task of converling Tesco's programs to run on the 3032 a comprehensive range of procedures to liandle each stage of conversion had been hulk up. These, he said, could be used not only for iCL. IBM conversion but for converting from most other makes of inframe to IBM.

Bell said he would be recruiting staff for the bureau combany and he will also be able the call on some of Testors 350 strong computer department is

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#### By Peter Hewitt

# GILB'S MYTHODOLOGY

Measuring program reliability

Another is that old and wellputer suppliers operating syssuring techniques, combined with "Intuition," which unfortunately has not been a good guide in this area.

Reliability can have mnny definitions, depending on what vou expect a program to do. Let us simplify for the purposes of this column and concentrate on ineasurements of prograin unreliability which reflect failarc of the algorithm to produce expected outputs, according to or other techniques, in order to higher level designs or

mould share their knowledga with a wider public lmm ediately.

If you think you know the answer, you elmost certeinly correct. heve not understood the ques-

The Interesting question few data processing projects degree of reliability that they level. This practice is dange- (handled one at a time) the reliability.

THERE are a number of myths rous because we have renson MTTF had risen exponentially tems get more reliable with ment in reliability to what we model. age. Mythis like these are really need, and not get inusually founded on ignorance volved in a wasteful merginal of nny real measures or mea- return on investment in levels of reliability which cost more

than they benefit any of us. it is at this level, high quality software, that the need for measuring accuracy becomes profitable; because If we are unable to measure accurately enough that we have reached our program reilability goals. then we are in danger of severe cost and schedule ovarrun os our reliability goal, we use an "overkill" of testing

make sure we have "enough." One method of measuring We should establish at the utset that nobody knows how has been used by TRW Systo construct a perfect program, tems is to take a representative nor how, in practice, to prove sample (see page 24 of Softthat an accidentally perfect ware Metrics (SM)) of all pos-program cuntains absolutely sible input combinations, run nn faults for nil possible inputs them all and manually audit (Including invalid ones), the results If 1,000 test cases Readers who know otherwise were run and three were incorrect, we could estimote with known uncertainty that 99.7% of another thousand random inputs would elso be rewritten by a sober program-

Another melhod used by John Musa of Bell Labs (New Jersey) is to plot the meantime then is the degree of reliability to failure of o program on a of a program. I find that very graph egainst the failure graph egalnst the failure number (1, 2, 3 etc. from some take the trouble to specify the point in time). This curve is matched egainst a model curve intend to build into their pro- showing previous experience grams before "decloring them of the gradual lengthsning of finished." The usual practice is the MTTF as more errora were to let them go on the air when uncovered. in one example he the failures are at a tolerable showed, after about 10 errors ways of messuring program

about computer program to suspect that the cost of in- to obout 4.5 hours. The goa reliability. One of these is that creasing the reliability of a was a system with at least len you cannot predict a program program goes up steeply hours MTTF. The points plot-failure from an unknown hig. towards infinity, when we are ted thus far corresponded to working with high reliability the model, which included a used programs such as com- programs. It is therefore pair of standard deviation lines important to limit our invest- on each side of the mein curve

> Using the model one could estimate that the ten hours MTTF would be reached at about the 47th failure, and using the deviation lines one was warned that the earliest we could expect was after the 43rd foilure and it could occur ns late as the 55th fallure. Naturally, we can use this data to estimate the aumber of hours the system must be run before we can expect to reach

Michael Fagan's inspection method (SM, p.57) has develoned a predictive technique The number of errors identified before testing, during inspection of source code and pseudocode, is calculated for individual modules on an error density per thousand lines of code basis. It has been shown that unusually high error density (for exomple 30 per 1,000 L.O.C., as opposed to 1 to 3) is an indicator of future high failure rates of a program. The program or module should probably be scrapped and

Bell Labs (EDPACS Feb. 1977, Jim Grimes) has also used file olidit programs to measure program reliability Indirectly in terms of errors in files.

There are other methods using artificial bugs (see SM p34) and multiple versions of the program, to check esci other. in short, there ere many

bureau will use the Unigraphics design aystem owned by the US aerospace corporation McDon-

nell Douglas. The originator of the scheme,
Dsvid Lloyd-Roach, of Lloyd
Roach Engineering, is planning
With all CAD, though, it does to launch the service in about six

**SOFTWARE FILE-1** 

CAD bureau plans

to use Unigraphics

on DG Eclipse

This will be supplied by United Computing Corp, the McDon-nell Douglas subaldiary which developed the softwore. In addition to the Eclipse, the configuration will include 8 VDUs, a CalComp 960 plotter, and other nard-copy devices. All of this will be set up in a

new office in the Birmingham area, to which customers will have to come to use the system. Lloyd-Roach is looking inthree-yeur contract with the to be around £22,000 per year, they will be entitled to 36 hours bureau, in return for a fee likely computing time per weck, and will also have access to the

hureat's expert CAD staff. A major attruction of the scheme is of currse the chance to explore powerful CAD techniques ot relatively low cost. And the fact that the facilities will not be in-house is seen os being an advantage in some cases, by minimising the organ-Isational Impact.

Data links to remote terminals are still impractical for CAD, noted Lluyd-Roach, because of what should be a very fast intaractive system. There were also problems, he said, with duta "One of facilities offered.
"One of the great attractions

Iransmission arrors.

Planning location

are available on the CDC to

n-house use.
Among Important house

the system are rold to

congestion, population from the und customer sits location is

factor is weighted a

paramoters eppropries us
mage and processed spin
stored information on make

Works. Natworks are current N

able for the UK and laring while others including bligs and Holland are being still.

Delitran Analysis, a solu-

nud transportation condey has developed transporter and software for behing

und private sectors, mist lioved to be the only like

for use hy the US governor

ils unorgy conservation:

very few package or

ported on Systime Sente

and larger configurative

will run concurrents

Cli.000 Including train

ducumentation and with

u viillable for 30 digus

Finar is stready in the

around 30 sites in the DK are

nround 30 sites to the Norman having users in the Norman serent shuring bureaux offens; system is Seleon, which but the straight offens, and the s

the software last year the verting it for use to half

The suflware will be:

pletely curversales

THE optimum location was sribution depots in the poly oddressed by the letter in wars to be referred by the Analysis. WHAT is thought to be the UK's Perkins, of Peterborough, and first full hureuu service in the Royal Ordnance Factory, computer-alded design Is being Cardiff. There is also a user in Called Ospot, the swys-interface with Deline's use-vehicle routeling and schools ayatam Trucks (Seltwin I) July 8, 1978) and, like the are available on the first

set up by a precision engineering firm in Birmingham. To be called CAD CAM Computers, the the system's accessibility to engincers was a key factor influencing his choice of it, which Services network m min followed a lengthy period of investigation.

"I found that it was a fool that take time to become proficient. months and is currently it can take up to about 190 hours negotiating the purchase of u to reach the speed previously turnkey Unigraphics system achieved by mechanical means. based on a Data Generol Eclipse but subsequently an output is possible which is four to five imes that of un average draughtsman.

One of the people responsible for the introduction of CAD at Baker-Perkins will be among several expert speakers at a seminar in Birmingham later this month. An introduction to CAD generally as well as to the projected bureau service, it will be held at the Europa Lodge. West Bromwich, on March 7.

### tially for eight client companies, each of them prepared to sign a systime to market financial modelling

A FURTHER prestigious customer has been found for the financial modelling system if nur with the selection of the pnckage by Systime, Systime will supply the software to clients moder an agreement with ather software it is fast the packinge owners, Finar Sys-

tems Ltd. of Omlington. Systime ovalunted several similar systems for the PDP-11, trial. the very high data volumes in- according to a spokesmun. volved. Over standard PO lines, significant delays would arise in botween ense of use and the

is its use of a very high level Unigraphics is already used by language that can be used three organisations in Europe, quickly and ensity by manage-including two in the UK: Baker-ment stuff, it was also one of

altornative schemes.

marhines (Softwere Fig.) 15, 1978). An octive user group is fur held two annual Atkins buys Oxsys building system and is one focus for con user-requested enhance the packago, currently is A primo application is in rupidly comparing the cust of

MMS system £1/4 million

INCOME of over Fig. from the MMS geens and financial reporting helped Package Progress ochleve a turnovat sinib million for the first timb - a growth of mot

IBM 370 systems

Puzzioi

Taking a practical view of the packages market

prepared to sell."

performance vin pornnicters.

rather than via coding altera-

It was precisely the built-in

flexibility of a package, he

suggested, that could lend to

savings in the cost of system

"For obvious economic rea-

sons, an in-house system is not

generally developed with the flexibility of a package. Yet the requirements for change in an

in-house system are exactly the

same as those already entered

"The result is that, of the twi

the package has a longer life and

more reliable and better docu-

mented than the typical in-

The volue of application

packages to the first time user

Packaged software was also

is less costly to maintain."

for in a package.

irouse development

The nasd for modifications

eated, noting that he had never

BOTH package suppliers and packoge users have come to was almost inevitable, he suggmaturity. This was the most obvious message of last Wednesday's meating of the IDPM package without modifications nesday's meating of the IDPM package without modifications. Which strikingly ignored the On the subject of maintecliched advantagas of applica- nance following the implemention software packages, instead focusing on practical issuas.

And although significant dif-ferences of opinion amargad, for example on the question of maintenance, it was possible for the chairman of the meating, Hedley Voysey, to summarise succinctly the main thrust of the argument as a concern with total life-cycle costing.

One view pcrauasively put was thot problems with packsged software most often arise from wrong expectations.

"Some people accm to tillnk that you can install a packuge, push the button, and it will go, sald Larry Levitan, of Arthur Andersen. "This is reinforced by aalesmen who promisc miracles, don't tell you the reol cost, and don't accept responsibility if things go wrong.
"I prefer to think of packages

as 'Installation olds,' fitting into the normal cycle of requirements study, implementation, and maintenance, it's essential to remember that the software is just one component in the total system."

Levitan emphasised this point in a discussion on selecting a package.
"You don't simply call in all

the vendors. The correct first step is to define your requirement, by identifying very Specifically what you want from the system."

Only then, he sald, was it possible to evaluate the usefulness of a package properly.

speaker, Ron Burrell of Zeus-

"Whether on thair own machine or on a buraau, a pack age enables a first-time user to get his feet wet. He can confron all the usual implementation customer himself should be capand organisational problems able of maintaining the software
— one common failing in package usa baing insufficient involvement of tha usar client. without getting involved in writing software."
While this was generally

agreed to by the panel, it was noted by Levitan that it could A rother different aspect was lead to the phenomenon of the emphasised by a subsequent "second-time usar." speaker, who argued that a "He bought that thing and it nackage was more than "a set of programs that someone is

sure looked great. Nobody told him though that it didn't calculate sales commission — or "A package is intrinsically whatever, in this, as in other conceived and designed with the iden of instolling it in many installinthms." noted Vince Wells, cases, if you don't know the environment, you're going to get of RTZ Computer Services. "It "Software packages are one of should be pussible to modify its

elthough there have been many significent developments over the last dacade, no one could deny that one of the most striking has been the continued earong growth of the packaged It was the anormous potential still projected for this merkat

that was the mein resson for the ostablishment of the NEB's software vanture ineac two years ago. And since then, an even more voracious demand for softwere has stemmed from the axploding small business systems sector.

In addition, a substential and repidly growing market has

IT is exactly ten years eince Software Fila first eppaared. And

opened up with the advent of ultra low-cost microprocessore With these trends in mind, Software File looks this work at

oftware packages, with a report on last week's mosting of the institute of Data Processing Managament. The IDPM called its meeting "A softwere packaged future: ere we getting value for

enterprise. It's ralatively unreguisted by the government, it's easy to entar the marketplace, and pricing is largely by supply and demand. Good products can be very successful, while if products get a bad name, they don't

"it's up to the buyer to beware.'

Echoing this warning, none of those spenking reacted strongly to the suggestion from the floor the inst good examples of free that packages could be a "soft"

way into software business

"Packages have a way of turning themselves into bespoke systems," commented one of those attending. "The aupplier then cherges for modifying it on a turnkey system."

With this caveat, most of those ettending felt that the value offcred by pockages was now compelling, and in one case ot lenst - that of the payroil was irresistible.

### Zeus divides six ways

ALSO celebrating its tenth birthday (see panei left) is Zeus-Hermes, which has marked the nccasion with a radical internal re-organisation.

This has created six independent operating companies under the wing of a holding company called Zaus-Hermes investments. Alm of the move la to preserve the "small company edvantages up to now enjoyed by the firm, which last yeer grew to o staff level of ii5 and a turnovar in exceas of £1 million.

The company's traditions'i real time activities, together with growing microprocessor work, will be taken over by Zeus-Hermaa Ltd.

Provision of turnkey systems, such as the accountant's system Pact, will be handled by Zeus-Hermes Computers, while commercial DP services, including the TP moniturs Cortez ond Cadiz, will be the responsibility of Zeus-Hermits Management Systems.



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Also ennouoced was the first Easytrieve aslectable unit, USIO, which makes it possible to eccesa an unlimited number of eequential input or output files

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TO reinforce its services in it will run the aoftware on o computer-aided design, W. S. newly-installed 256K Prime 300 Atkins hes bought the Oxsya system, which will be devoted building system developed by Applied Research of Cambridge. Oxsya is particularly well

Oxsya is particularly well sulted to projects making substantial use of standardised and modular components and is able to take on many of the more

Atkins will use the system first in connection with a new university complex at Tiemcen. Western Algerlu, for which it has un eight-yeor consultancy technical tasks, such as cuntroct not only to design the repetitive drawing and quantity building complex, but also to

The Pru chooses Adabas THE massive Prudential Aasuindependence at field level. The rance Company has chosen firm also wanted to be able to Adabas to handle its DBMS

change the database without applications, following two reloading or reorganisation. years of evaluation and perfor-Adabas ia already used by one mance trials. it plans to use it of the Prudential's ovarseas first on Ordinary Life assurance, subsidiaries end by three other UK Insurance companies: Com-mercial Union, Cornhill, and processing around 3 million policy records both in batch and A perticular attraction of the aystem for the Prudential is

Phoenix. Following its selection by the London office, it is likely to be purchased elso by the

understood to have been data Prudantial'e Austrellan office. Mini LP adapted for DG use

ORIGINALLY developed for the Digital Equipment PDP-Li, Scicon's minicomputer linear programming package Mini LP has been adapted for use on Data works in Northwich Cheshire, it one of the first applications of formulation service to clients.

Approach to testing

PROGRAMMER NOTES

WHILE the last ten years have ylelded a substantial crop of propossis for improving the structure of programs, it often seems that much less interest has been shown in the thaory of

indeed, there is a delicate suggestion in much talk of structured programming that the correctness of software is somehow ensured by adopting these methods, so that the need

for testing is greatly reduced.

One strand in this discussion has been the notion that program construction and program analysis can be combined into a single process. Most often, this has focused on the techniprogram proving and the use of

it was therefore interesting that a recent computer aclance paper' should highlight aome of the deficiencies of program produg in the course of expounding a novel (though companying above). third.

Latest customers apper should highlight aome of the deficiencies of program proint the Coats Palot and Pasods a novel (though somewhat abwhich will run the Both program proving and Both program proving and program testing, it notes, are methods of functional verifica-tion. They diffar though in the way that information on the in-

The paper concludes, "As ied function la introducad. In the case of proving, the mation introduced ia a pair assertions, called prendition and post-condition, To a meaningful and adaquate, and should play,

hose have to maet two import-Firstly, they have to be strong anough to describe pra-ely the sets of input and out-the values and the correct rela-

tion between them. "Secondly, the essertions

must have a higher dagrae of authority as to the intent of the program than the program text itself. This cannot normally be expacted if they are developed at the sama tima as the program and by the same parson. it is in this respect, the pape

argues, that testing offers an intrinsic advantage, because it permits a high degree of Indapendence between aoftware writing and aoftware verifica-"The key point is that tast

cases can be developed and understood by peraona who are introduce into the verification process information that may not have been communicated in other forms before. "As investigations on pro-

gramming errors have shown the most prevalent errors are so-cailed design errors. These errors occurred when either the problem to be aclved was misunderstood; or the knowladge of applicable actutions was inadequate."

other formai methoda continue to fail ahort of their expectations, it becomes increasingly important that we better understand the role that teeting can

"A Complamentary Approach to Program Anglysis and Testing, in Lecture Notes in Computer Selsuce, Vol 65, information Systems Metho-dology, published by Sprioger-Verlag.

solves on the evening at

Hanks are notocloss to collar and the Image operators are expected to come regordless of the way to turned up for his ling dressed in blazer toward but instead of a the best string of brightness of brightness of the string of brightness of the best of

string of brightly co.

beads. The manager way time in teiling him just start

bank expects free

operating in a similar way.

That view was put to me by a menager. It's an interesting thought, because at some sites the operators are allowed to the operators are allowed to please themselves, more or less, with regard to dress, while at others they are instructed to text of the computer room it is wear sult, collar and tie, and on no account to dress casually.

Contributing to this odd state of nffairs is the fact that the computer room is a hybrid environment; it is neither office nor workshop, but a mixture of operator might be sitting at the console, dealing with a stream of system messages, and the next mounting a tape or disc, loading stationery on the printer or even cleaning that device.

So what sort of dress la right for the operator? In my view, the answer is smart but prectical; comfortable but sefe.

noticed a darts board and

One of the operators told me

that both gemes are quite popu-

lar with the operations steff as

they cen be completed within

half en hour and so are ideel for

in my view, such pastimes are important ea they teke the

puter room end thereby itely them to relax during breaks, At one instellation I know,

quite a sizeable card school grew up. After a time several of the

And you could always tell

which of the leds hed conte out

on top during e card-playing

session — he would be the one

who returned to the computer

room grinning like a Cheshire

Table tennis is enother geme

popular among operations staff.

At en Instellation where I once

worked we used to play doubles.

other good game; it's just right for coffee breeks. At en instella-

tion where I once worked, we

Thin week's oftening also fells into that category. The ambject is the ISM OS Modify command which may be

used to good attent lu reletion to

After a Writer procedure has been started to e punch und, h will acled

ob a from output queue 8, tha accepted norm for punched output, and trousfer it to the neelgued device.

Aud as the Writer selects each job from the output queue, the nymom sends the operator o mennage lu-cluding the address, or identifier, of

OS Modify helps keep

track of punched output

MANY of the hiuts which heve appeared to this column concern the uso of Operating system facilities to eave the operator a lot of unnecessary description.

This oil works five until, say, holt a decay lobs are purched in quich

HINT OF THE WEEK

Table or ber football is an-

operators' minds off the work-ings and problems of the com-

coffee breaks.

tors' rather plush rest room.

It might seem odd to relate

Games operators play

stallation of Marks and Spencer, During breeke, that is.

WHILE at the West London In- used to play it day and night.

backgammon set in the opera- an unfair advantage over the

operetors sterted pleying for practicelly non-existent until

money end on one occasion one five-a-side football matches

of them won £20 during a half- were ployed between the two

single game,

can be of benefit

dirty tasks during the course of their duties. Working the printers is the best example, it is an important consideration. Card readers, for example, are -capable of digesting unusual forms of juput, auch as tles and usuelly the responsibility of the poor old trainee, who has to hump dusty boxes of stationery On one occasion, a friend of about, change ribbons and cleen mine, an electrician, was working in the computer room when the devices in addition to reao girl's hair was dragged into a ponding to system requests for reader as she was inputting

some cards to the device. For-

tunately, he had the presence of

mind to press the stop button

and so prevented a aerlous

accident. Nevertheless, her halr

had to be cut, and sha was taken

to s local hairdresaer who fin-

ished the job. Safety factors aside, managers

Working shifts always gave us

programmers in this regard.

They would challenge us to e

game during the day shift on the

understending that the losera

would pay the 5p cost. Need I

soy that we never paid for a

Seriously though, aside from being a source of amusement, those gemes did o bit towards

Improving the relotionship bet-

wean the operators end programmers et tha site.
At enother Inetaliation,

operator/programmer relations were poor and communications

Tha results were quite

emazing. Kicking each other

black and blue, end heving a

drink togethar afterwards,

teught the operators that pro-

grammars are humon beings,

and the programmers realised

thet operators are individuals

After that, the operators and

programmers no longer grunted

at each other but ectually said "please" and "thank you" -

that's aomething for managers

dozau jobn are punchad in quich

the operator wautou a fet of time "aplitting" the output, fer, willhe printed listings, punched output hau ue header and troller lebel preceding

and following each job.

By using the Moulty command, the operator can instruct the Writer to

paune after it han coused e job to ba puuched. The command has the fol-

lu practice, it is often bost that the

station and dooin with the nyalem

sole operator remainu of his

lowing termol; F xxx, Pause = Daleset

and should be treated as such.

paper changes. Some sites provide the operators with dust jeckets, to be worn ea they operate the printers. At installations where that is not the casa, the management should think again or, alternatively, award the staff an allowance to covar extra cleaning bills.

But I must take up my manager friend on his view thet over-casual dress has an adverse effect on ettltude. In my experlence, thet is not always the

have to perform soma rather

Do careless dressers

called experts had failed.

An operator I once worked ment places greater emphasis on with was noted by his colleagues appearance than technical for his ability to sort out system ability when considering proproblems, and not for his appea- motions.

By way of contract operators at university as rance or ettitude. Many a time At some sites, the operators no such Intarferente management. They are dehe would solve a problem in the ure expected to wear suits becomputer room - and thereby cause they uften get visits from ter please themselver is prevent an additional IPL, or members of other departments regard and it goes a lear system load - ofter all the so- within the company. Fuir enmaintaining the na ough, I suppose, but If that is the To me, that example is a sad cose the operators should at atniosphere which piere reflection on the fact that, at least be allowed to please them-

OVER this post few weeks t have received a number of Advisory Group. c/o the Copertment of Here to University of Technology, Loughborough, Liberty enquiries from persons wishing to loarn more ebaut twe recont publications on the health hezerds tacing YOU

operatoru.

The first, celled Eyo Tests for YOU Operators, lu trom the YOU Eyo Test Advisory Group (Op 8 pet, Fobruary 1). It is a discursion document in which the group proposes a battery of eyo toris for YOU operators.

For turiner information, contact Tom Stewart, YET

The second paper is ontilled Visual Open let. Nightmano le lhe Operator? by the Occupation to Committee of the Association of Optical President Fabruary 8). For further information contact the Size ton. Public Relations. 27e Sloans Square, London Will

### NEWS IN BRIEF

#### **Nixdorf plans** in Ireland

THE new 19M 3880 disc cantral-ler introduced with the IBM 4341 (CW, Februery 8], le a pawerful pracesser which could be pro-grammed as a back-and database PROBLEMS over building costs for a Nixdorf plant in Duhlin have now been resolved, and the West Germon small systems dulenel details revealed by 18M, which new says that the 3880 is company is planning production in Ireland later this year.

Nixdorf wanted a factory built tu the same specification os a new plant at Ita Paderborn headquarters, and misunderstandings between the company and the Irish contractors made it appear that the Dublin plant would cost considerably more per square foot than the German THE price of a Nascom 1 Z80one (CW, October 20, 1977).

#### Moscow scores

THE two "unidentified iBM machines" which will do tha actual scoring at the Moscow Olympica prior to the information being disseminated by two ICL 2904s (CW, February 22).

#### First outlet

FRANCHISING, long esta- chips.
Sales director Kerr Borland has reoched the personal contputer business and the first frunchise choin called Computer bourds will double demand beland has opened in Brussels. cause many people, schools in

bipaisr device which uses the same basic technology as the processer chips, and is made from t 400-gata masteralice. ISM says that because of Ita

spacialised central application, the instruction set consists prin-cipelly of brench and registerariented instructions.

which new says that the Joou is besed an e five millien instruction. The intrinsic pawar of the depart second eight-bit deta werd misro which uses 18-bit micremistructions. The micro is an ECL besis of a back-end detabase.

### Nascom 1 microcomputer kit price reduced

Powerful processor

based microcomputer kit has dropped from £197.50 to £165, and the long-awaited Zeap edltor and assembler program which runs on it is now in the

This has emerged from sd-

The price cut for the kits was meant to coincide with the availability of ready-made bnards at £210, but these have been delayed by shortage of chips including 74LS163 binary counters and B1LS97 huffer

said, "We've barely had enough of these chips for the kits we are European outlet of o US sending out. The ready-made,

particular, want to do software but not soldering. We had hoped to have started building readymede Nascoins by February 1 but now it will be the middle of

Zeap, the 3K byte assembler program written for Nascom by Paul Chepman and Geoffrey Roughton of Sigma Accounting and Management Services and announced at the PCW Show last year, has finally mode it into dealers' shops.

Costing £32 on cassette it runs In Nascoms with expanded memory, as dn Tiny Basic and Super Tlny Basic which become available at the same time os the memory expansion kits in

tion among potential users in ndustry, a consortium of consultancy firms has been commlacioned by the Department of Industry to carry out a threephose study project.

Operating under the umbrella of the Computing Services Association, the project additionally oims to see that more text processing consultanta are trained for the future, and that the difficulties users encountared in bringing in data processing are not repeated with office

The five firms are Arthur Andersen, Langton Information Systems, Logico VTS, Poot Marwick Mitchell, and P-E Con-

sulting Group.
Phase One will cost £40,000

**CSA GOES INTO WORD PROCESSING** 

TRAINING, AND INTERNATIONAL ISSUES

Dol orders office

automation study

DIANA DUGGAN . . . "apreeding the goepsi shout ward preces-

firms themselves, mainly to find prospective clients for Phase Two. In this each consultoncy will corry out no in-depth study of one substantial commercial or industrial firm that is a potential user of electronic office systems. finding out how it works, and how office automation could be applied to it, and designing text

This will cost about £20,000 is expected that it will pay half important.

From these studies should come a better idea of what offices should be like in the 80s The designs of applications that ere developed will be fed back to

word processing manufacturers to help them in their product plenuing. Moreover, a wider field than just word processing

will be considered. Facsimile, COM, Teletex (CW, February 22), Prestel, ond electronic mail will also come in.

Heading the project is Colin Leeson of Langtons, and Diana Duggan, of Logica VTS, is tech-ulcal leader. She describes the bosic ideo as "spreading the gospel" about word processing among potential user organisotions, both to improve the efficiency of UK industry and also to propiote our own office systems manufacturing sector.

She also hopes it will help to avoid "the horror people went through with the introduction of computing." In addition she says there should be a great deal or interesting thata coming out of the studies, to do with how firms' communications work at present, how much of their mail per study and since the client firm should benefit considerably from the information gained, it new consultants is also very is internal and how much exter-

### Education division set we to develop training policy

SHORTAGE of computer staff, an important area that the CSA particularly among service firms inust promote. Submissions or which are currently looking for to made to the Manpower Ser-3,000 people, has prompted the vices Commission on plans for CSA to establish a new division for education and training, and to appoint a full-time training

The division's first tasks willbe to develop a training policy and schemes for computer-alded training, and to talk to government departments, universities and polytechnics about the industry's needs.

Alan Thomes of Data Logic aaya the UK haa a particular problem in this area, with a "haphazard system" of training which does not go wall with our rapidly cheoging industry, end a "gap in understanding" between industry and the education ays-

For instance, he says, many university staff atill think that angineering training is necessary for caraors in computing, while recent studies have shown that arte peopla perform just as well in the servicea industry ee science people.

Alan Benjamin, CSA directorgeneral, edds that the idea of convarsion courses for people puting Sarvices inilustry Conwith experience in other fields is "totally neglected," and this is

courses of high practical con-tent, he said. The Training Division will also carry out of research project into the con-tentiona question of DP aptitude tests.

On the international front, the CSA is starting a dialogue with its counterpart associotions in Europe, the US, Caneda, and Japan on important matters of common concern such as notional information policy, government regulation, unfair com-petition, Cuatoms duties on data, and cross-border data flow. The queation of software copyright is elso being dealt with the CSA is to hold a one-

day seminar on this in Juna. There is e proposel that European countries levy a tariff on magnetic tapes according to the velue of the information content, and the CSA la concerned obout the effect thi could have on businesa, end ebout the difficulty there would ba in assessing such volue.

Plans are also being drawn up for the Second World Comgress, to be held in San Francisco in Juna 1980.

### Into battle —by computer

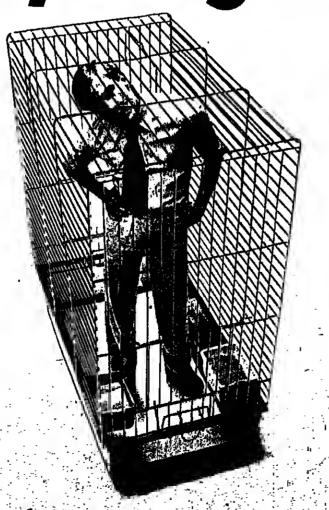
AS a result of recent burds ulmus attors, the Shilah Army's Battle. Indoors, ut Sovington, used the Group precides training suction at Boyington is to centinus duyed new contupts. Normally, such partial simulations are done with training proops.

Using an Olivetti P8080, the Using an Olivetti P8080, the properties from the Olivetti system.

loping its use of computern in bettle almufations are done with training proper. The read thing out on the field."

Using an Officetti Papado, the At present the Officetti system proup has been puttling regiments only produces "mathematical" auch as the Grandfer Cuards and unmuluflode in read time, but there are plute to move to a larger paper and according to an Army computer and install graphic applications; "all our ouetbrack, according to an Army computer and install graphic applications;" all our ouetbrack, according to an Army computer and install graphic applications in present of the computer and install graphic applications are done with the read thing out on the field."

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Upgrading your micro chip could Whila a Digital micro - LSI-11 board or PDP-11/03 box - can be working for you in a cost you a lot mora than you bargained fraction of the time. for, aspecially in raprogramming and radesign; whareas a Digital system will probably cost you not much more than And your finished product will be out there serving money for you white you get busy on other new ideas. the upgrada aquipment alona - and canainly gat you back into business faster. Il you really want to substentially cut your time between idea end It you're just thinking of computerising, atan with a call to Digital.

If you're looking hard at a cobbled, patched, tinkered, still hall-linished micro product, you'll be smart to chack our packaged varsions. They're the ideal way to spead things up. project... call Digitall
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tangle, esk lor o Digital sales
angineer to call you. This is not to say that they're cheapar than micro chip bargains. o way. You pay lor what you gat. But you'll save significantly on And you'll probably save about si lo twelve months of your life.
Digital micros era designed to be Digital, me out of thaic very simpla and aasy to intarface with either general purpose interfeces or your own assy-to-implament dasign. pd if a still not working nghi And they also teem up assily with much of the softwara and systems wardrobe of the Digital PDP-11 Call me D. Send me brochures on LSI-tt D. 11/03 D, packaged versions D. Random accass floppy disk systems. powerful real time systams - RT-11. Industry: standard peripherals - DECwriter printers and video Languages lika FORTRAN IV (scientific, engineering) or BASIC Sent to, Tarry Clarke, Digital Equipment Co. Limited, Digital House. Kings Road, Reading, Berks., RG1 4H4. Tel. (0734) 58 35 55 Iconversational) es option.
The boxed PDP-11/03 is the size of a stared receiver. It comes with 8 KB (RAM, ROM or CORE) and can axpand to 66 KB.

> digital Digital Equipment Co. Limited

#### mossages, while one of his collec-guou solutily removes the purched output from the unit. the punch device and the time the job was output. The operator may then We welcome your views

OPERATORS often complain that nobody listens to their point of view. Well, Op Spot is itstening and Bernard Allen would like to heer your opinions and kleas on ell metters relating to

Op Spot, Computer Weekly Dorset House, Stamford Street, London SE1 9LU. Telaphone calls are equally welcoma and Bernard can be contacted directly on 01-261 8035.

TIM PALMER

REPORTS

2900 CLUB

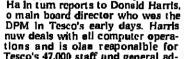
ON THE

### Directorships for three Tesco men

three other Tasco enmouter nien have been appointed executive

Frank Farrell, 34, come into the group when the Victor Value grocery chein was taken over in 1968. Among the posis he has held is that of operations monnger and he is functions, including the software and database groups, and the com-

Richard Gardner has been with the group 14 years, starting as a pay-rull clerk and then progressing ming departments. He is reaponsible for the operation of the sites at





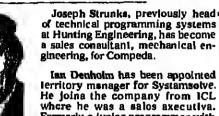
Roger Sterry has been appointed general manager of Jaserve's bureau services division. He was formerly operations manager, and has been with the company since its forma-tion in 1971. Malcolm Hopping, pro-moted to the position of general nanager of the company's business systems division, was most recently employed by BOC Datasolve as egional controller for customer services. Barry Briggs has left DEC, where he was a senior sales engineer, to become general monager to charge of sales and marketing of the laserve bureau and Jemini small

Aifred Baganii has jained Wright Air Conditioning (Birmingham) as an area sales manager. He was lornerly a senior dealgn engineer with a Canadian air conditioning company in Toronio. John Eaton has appointed an area sales manager for the area south of Olriningham. Previously he worked as overseas sales manager for the

Keith Swain has been appointed by Jaquard Systems as a marketing support representative. He will be responsible for supporting the current software packages avoilable for the Jaquard range of videocomcomputer manager for the John Wilmott Group of construction minoi installations at warehousea

Robart Pearson joined fesco from IPC in 1974 as n senior systems and Ivat. His area of responsibility covers all applications and he is also in-

volved with systems development.
These appointments follow the Tesco tradition of promotion from within and the new directors report to gorry Grange, director of DP, who was appointed from the department. Ha in turn reports to Donald Harris. tions and is plan reaponable for Tesco's 47,000 staff and general ad-



ncering, for Compeda. Ian Denholm has been appointed lerritory manager for Systamsolve. He joins the company from ICL

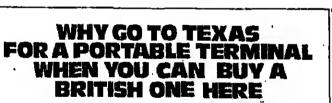
where he was a salos axecutiva. Formerly a junior programmer with the Electrical Research Association, Jenny Boddy has become a junior analyat/programmer, and Howard Green a senior analyat, previously working for Metat Enclosures as a senior systems analyst. Ralph Jef-ferey, formerly a senior programmer with the Milk Marketing Board, be-comes a senior analyst programmer. comes a senior analyst programmer, as does Louiso Wong, a former consultant with Atkins On-Lina. Until recently a programmer with Quadrant, Edna Gregory has joined the company as a junior analyst pro-

Dennis Thorn has become deputy chairman of SIA Computer Services. He was formerly finance director. Previously haad of marketing, Alan Grig has been appointed managing irector, raplacing Gerry Pick.

Barry Stemdale-Bonnett, formerty DP manager for the United Bank of Kuwalt, has become business syseins manager for McGregor Swire

#### New address

SCL has moved its premises in Edin-burgh, as a result of the formation of the new company, Lloyds and Scot-tish Computer Services Limited, which will provide computing services to all group companies. Available as hardware will be the group's 19M 370/158 and other group computers throughout the UK. SCL'e new address is Northumberland House, 41 Northumberland Street,



COMPACT 2 is the silent portable hardcopy leiminal dasigned and manulacturad to England, With its built to acoustic coupler, you can gat on-lina to your computer within saconds whatevor you ara—all you naad ia a powar point

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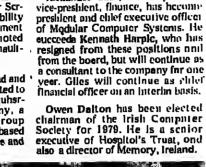
Silverwood Housa, Oxshott Road, Leatharhead, Surrey

Tel. No. 03723 77374 Agant South East Rubide Ltd. 01-858 5908, North, Garrord Calculating Systems 061-477 4960



Mary O'Toole has been appointed director of Harrison Computer Scr vices (Ireland), with respunsibility for the murketing and development of financial systems. She is promoted from her former position of consult-

Norman Batty, Jamos Boland and David Roger have been appointed to the board of directors of Farquisrson Grothers. The company, a member of Macfarlane Group (Clansman), is the Glasgow-based manufacturer of office machine and



Alexander Glies, currently senior



ndation etona for the new EMI acanner huilding at Christis lospital, Manchaetar, was laid leet month by journalist and concer potlant Mrs Pat Saad.
Over £1.5 millen to provide the equipment, the building and ell running and staffing costs, has been raised by the Pat Saed Appeal Fund, launched in March 1977. Assisting Pat in the ceramony ware \$4-year-old Olive Strowdon of Blackpool (far left in

Acncins County Printery Schoo Manchaster. Olive and Nicola represented people from all over the country who have supported

Also present was Dr Godfrey Hounstlaid, EMI's research scientiet who invented co tomography acoming. The EMI-Scenner 7070 is the world's most edvanced CT system, and can collect elmost 1.5 million X-ray readings from a scen time as chort

#### DIARY

The renewal of interest in machine translation. R. Jahnson. BCS Natural Language Translation Group, King's College, Strand, Londan WC2. 18.00.

Snowdon, of Blackpool (far left in our pictura) and nine-year-old

Nicola Farrow (for right) of

MARCH 5
Mascot — n modular approach to software construction, operation and tost.
BCS East Anglia Branch, Eastorn Flectricity board, Russel Road, Ipswich, 19.00.

Voice Input — the next computer revolution. J. Seunders. RCS NW London branch, Reliway Hotel, Groenford, 18.30. Ward processing, M. Marriott, BCS Cheltenham and Gloucester branch. Gsis Club, Fsirmille Gardens, Gloucester. 18.30.

MARCH 6-7
Mortex '79. Europs's first specialist exhibition for the teasing and used computer business. Felbridge Hotel, Essi Grinstead, Sussex. Organisod by Watker-Eills Ltd., 54 Dundonsid Road, London SW18, Tel. Tony Eills on 01-543 1 148.

MARCH 7
Air traffic control. A. Molean, IESTE, Electricity House, Wellesley Road, Croydon, 19 20.

don. 19.30.
Computer frauds, K. K. Wong, BCS
Humbersida branch. Willsrby Manor
Hotel, Willerby, 18.30.
Meeting, BCS Olsebiad group, 8CS HQ,
13 Marsfield Strast, Loadon W1. 18.30.
Data analysis Part II. I. Pelmar, BCS
Oatabase users group, New Engineering
block, Uolversity of Central London,
London WC1. 14.00.
The Chinese army approach to powerful procassing. D. Parkinson, BCS N.
Staffs branch, Computer Centre, Keete
University, Keele, 20.00.
Visit to Traffic Control Centre, BCS
Wolverhampton branch, Waterloo Road,
Wolverhampton. 18.15, Numbers restricted, Conject Geoff Hamser, Wolverhampton 27371, axt. 44.

MARCH 8
Meeting, 19M CUA managament
group-White House, London, 10.00.
Communication with softwere. P.
Macleod. BCS West Herts branch, Heath
Park Hotel, Hemet Hempstead, 19.30.
Packet switching networks, BCS Kent
branch, St. George Hotel, New Road
Avenue, Chethein, 18.45.
Computers and the smaller business.
BCS Oxford branch, Oxford Europa Ma

tor Lodge Hotel, Wolvercole, Oxford, 10.30.

Students competition evening, W. H. Edwards, I. W. Draffan and E. Rose, UCS South Yorkshire branch. Heriol House, Sheffield City Polytechnic. Sheffield.

Cobol quirks, J. Triance, BCS New-castle branch, Barras Orldge Oulidings, Newcastle University, Haymarket, New-castle 18 00

MARCH 10 Final of schools management game. BCS Belfast branch, independent Com-puter Services, Queens Road, Betfasi, Closed event.

People and computers in project management. One day seminar. Associa-ilon of project managers, Waldorf Hotel, London. Tel. 01-799 3182. Man/machine interfacs, saminar. Association of Project Managers, Waldorf Hotel, London W.C., 18.00. Details APM, 01-799 3182.

01-799 3182.
Word processing. B. Gifford. BCS
Croydon branch, Fsirfield Hells, Croydon.
18.15.
OIY, BCS, Reading branch. Copper Inn,
Panghoerne. 20.00.
Automatic programming lenguages, J.
Cockley, R. Weaver, BCS Harrow eubbranch. Harlow Technical College. Harrow, 18.30.

Robotics for angineers, iMechE, 1 Bird-cage Welk, London SW t. Rogistration required. Tel. 0284 63277, ext. 68. MARCH (5

Cashless society, J. M. Williams, BCS London branch, Walderf Hotel, London WC2, 18.00. Project management symposium. BCS Coventry brench. Lanchester Polytech-nic, Coventry, 18.30.

MARCH 20 Logic for databases and programs, R. Kovalski, BCS Formal Aspects of Computing Science Group, Polytechnic of Central London, Lobdon, W1, 18,30.

MARCH 25-30



By Judith Morris

APPOINTED managing dwent Prints: Computer (UK) is kind Prints: The company is the substillary of Prime Computer (UK) is kind to the substillary of Prime Computer (Computer of Prints of P Anne Sharpley has been appointed a shrector of Telecomputing, resrecent appointment be mis ponsible for technical support for the users of the company's TPS product She Joined Telecomputing in 1974 as keting director. His promotes tows the launch in language to the Prime systems, and the role he will sustain the concernity of the concern project manager, and was responsible for histalling the first TPS sys-"Xignision. Edwin Monger has been appointed company secretary of Dicoll Electronics. He is a fellow of the Institute

Dimean Black has been promaninger operations to an imminging director for Corp. the computer bureau substation NCB. Previously many Compower's Doncaste on Robert Reid has become ge manager in charge of profest



Sally Hoffman has beneale or consultant with Fister. She was formerly tomer

Malcolm Chadalettal recently opened Municipal mal sailes and service com pany last year from Ce: he was systems sale.
Manager of the technical
Mike Ward, who und ba tenis programmer with KI: also organise training for E-customers in the UK.

... OF SEVEUR

### Liveware Saga

tem in Australia.

d Chartered Accountants and has

lanked after the interests of Dicoll

Nicholus Burrell has become a

salesman for the North-Fast with

man for Rank Xerox, and has held

Ris-Deltak, He was formerly a sales-

similar positions with Rowntree Mackintosh and Yelluw Pages. Ins-

Deliak hos also appointed two other salesmen, Bob Holtom and Stephen Mead, Holtom, who used to be a

major occounts salesman with Rank

Xerox, and has also worked for Cad-

bury Schweppes, will serve the Midlands. Mend will handle

accounts in West London and the

South-West, He previously dealt

with national occounts for Rank

John Godley has left IPC Husiness

exhibitions. He was previously

group advertising manager for

THE fifth International symposium, Atm and Microcomputers and their applica-tions — MIMI 73 Zurich — Is to be held in

Junes — Milbil 79 Auren — E to be beli in Zurich, an May 22-25. Deadline for papers is March I, and three copies of a 200 word abstract should be nent to the Secretary, MIM 78, PO 90x 354, CIT 8053 Zurich, Switzerland.

Call for papers

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an escape

THE finol message from Robin Rodin of the BBC was to urge

users not to miss out on VME/B

- which led neatly to the next

spenker, Pelor Turnor, ex-ICL

and now with Sufe Computing.

Turner's message was that DME makes moving to 2000 from 1900

or System 4 so easy that users

may never take the VME plunge.

the computer Press in this con-

lext, "Before DME arrived, the

computer Press criticised ICL

hechuse conversion was so diffi-

cult. Now ICL gets criticised

because in some cases progroms

run more efficiently under DME

than under George III or under

"The DME versus VME Issue

Luddite as a policy."

intellectually

that there might have been a

VME.

He had some harsh words for

clause

KNOTT ..." want to sail."

Tory election victory could bring takeover bid for ICL—broker

growth." (Knott should be en-

cournged by the fact that on his

appointment as managing director of ICL, Dr Chris Wilson

named sarvices as the most

Important growth area for the

the national average, and looking undervalued on its current shore price, there is a fair chance of a takeover bld in the event of a Tory victory at the next General Election. That is the controversial view of Simon Knott, partner with stockhrokers Greene and Com-

Speoking at the 2900 Club meeting in London last week, Knott suggested that the Natinnul Enterprise Board's 25% stake in ICL could well be offered for sale by a Tory government, triggering a takeover bid.

"If the NEB could find a buyer who was prepared to pay a preminn on the ruling share price - perhnps Sir Arnold Weinstock of GEC - It might well

Knott expressed enneem at the effect of the £40 million lonn from the government, repayable under a complicated formula which would be triggered if ICL's profit exceeded 713%. "If ICL were to buy an Amerl-

can company with 12% profit on turnover, the excess an that company's profits over 711% would be owed to the govern-

in the Press exacerbates the "The I cross mean that If ICL is problems of choice facing the to avoid repaying money to the government, it can only increase "DME is a transition, not an profits by increasing turnover. escape clause. From blue or white to orange, it is clear that not by increasing margins.

"This is a severe handicap, it the line of least resistance is means that it cannot make a LiMi But at the end of it, all you rights Issue of shares to raise have got is an orange 1900, 2900 under VME/B or K has so much money without immediately increasing turnover, so any cash il more to offer." He elted program nceds must be borrowed. If I evelopment using IDMS, and were on the board of iCL, he duta dictionary, as examples. would do a deal with the "Yet it is not unlikely that government to get the pny-back new applications will be devemillstone removed, it is not good loped under DME. One cannot for a company to be turnover candenin this out of hand withconscious rather than margins out knowing the facts, but it seems to me to be intellectually

and profit conscious." Looking at the split between sales and rental business. Knoti User reactions were decidedly noted that ICL did about £250 mixed, with one commenting million business in seiling computers' and £235 million in the 14-fold improvement in VME, but it still performed at only one rental and aervice side. He estimated a £56 million income from rental assets of £142 mil-Consultant Fred Lamond llon, and a £20 million profit

commented that ICL designed from this business. machines, and then expected "A buyer would be prepared .to pay £200 million for this busithem to be used in the "right" neas alona, and get the way. "Computers are a means to manufacturing and aales doing productive work. There is businesses thrown in for nono point in converting if it is cheaper simply to get in
thing," he said.

thing," he said.

"Big companies like BOC are

creased throughput by using increasingly looking at computer services, and the City

### ASTMS wants change in attitude to work

DP department. A case in point amployment. was the invitation of Barrie Sherman, research director at the white collar trade union ASTMS, to speak at last week's meeting.

"Neverthaleas, we have to apply choice—wa have to apply microelectronics. But we must tackle the social consequences

impending information techno- Sherman called for a complete lecogniaing that the problems and the opportunities stretch far beyond the competition and the competition are competitive. beyond those presented by the towards work and promota idainicroproceasor.

affect a lmost every industry and investment in the future, and service. It cannot be boxed off good for all. If they try to do it lke the motor car or the aaro- the other way, by natural wasblanc: there is nowhere to hide. tage, that just creates another Also, unlike other 20th Cen-problem, that of unamployed ury innovations — most of school-leavers.

the 2900 Club is that it provides a on the production side, so that forum for discussion of affairs we can no longer say that high oulside the narrow scope of the growth equates with full

He chose as his thema the of the coming revolution now."

The microprocassor will regard people who leave as an ure. Companies must come to

the services market for its can't see it wanting to come back again now," he sald. "It is difficult to see another British company which has the musele to buy ICL and would really believe that it could run the company better than the present

Knott would also like another Many in financial circles also US negulation, but thought that regard the need to keep margins the City would be unhappy at below 71/2% as a trivial problem too much capitni investment on noting that the computer inthe Continent. Dunlop's painful experience with Pircili hod given dustry is very demanding of research and development ex-European forays a bad name. penditure. Indeed tCL is anxious Commenting on Knott's view to reduce the proportion of turnabout a possible takcover of ICL, over that it spends on R&D, Graham Mcck, electronics inwhich indicates that the comdustry analyst with Edinburgh pany has identified plenty of stuckbrokers Woud Mackenzie ather necessary expenditure which will continue to keep was surprised at the mention of GEC us a possible bidder, "GEC margins just below 75%.

Brick-bats and bouquets AN evan-handad distribution of brick-bats end bouquete for ICL made up the cantribution from Robin Rodin of the BBC. with a new multiferious operating

system like VME/B, you cannot expect it to work straight away, but the kinds of problems that we The brick-bets, hurled with feeling, were inspired by his axperience with the 2960 which the suffered have a great effect on BBC installed in May 1976. staff morals, and cen be disset-rous for user confidence."

"It must never happen egain!"
was his heartfelt rection to what occurred nest.
"The machine was handed over to us in July 1976, and we intended that BO% of the work,

mainly running on o vory satisfac-tory but averloaded 19048. should be transferred by Christmas of that year. Evon now, I don't bollave that 60% has been 'We found that the 2880 worked — every new and than. We'd submit a job and dey and it day end it worked. We were get-

ting a meen timo betwoen failures

wers long pariods when it was

Rodin contrasted the VME/8 esparience with what happaned when he warked in an inetallation when he warked in an inetaliatia which got a new 1903 in 1986. but It worker). The 2960 shoul have arrived with a beatc subset

of VME/B, and the edditional facilities shauld have been added in a phaesd mennar. The big bang approach just dossn't wark." Admitting that it sounded as if

he was talking about a completely different machine, Rodin went on to preise the IDMS database ava tem an the 2960, describing it as one of the best places of software ICL had over latteduced.

# Now it's as easy to buy an add-in memory board as a can of beans.



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By Martin Banks

#### **MICRO NEWS** MICRO NEWS SPECIAL

IF European governmenta fail to extend their current policies towarda microelectronics to include the wider aspects of the use and development of information technology, some of the "horrific acenarios" of the impect of technology on employment could come to peas.

That is the view of IAN MACKINTOSH, whose compeny, Meckintoah Consultants, has an envieble track record over meny yeers for projecting the impact end development of elactronics and information technology. Meckintosh hea playad a aignificent role behind the scenes

in influencing policies throughout Europe, perticularly towards supporting growth in microelectronica and related industries.

Although he epplauds the UK government's lately ecquired awereness of the Importance of micros, he believes this ie merely a case of cetching up with the last

decade and that the future now lies in the convergence of con. puting, telecomme and microsle. tronica into an integrated into mation technology.

in this exclusive interview with Mertin Banks, Dr Mackintosh and larges on his views on the deva lopment of iT.

# The UK needs an Institute of Technological Planning

should be looking at how to explott the services and products bining computers, telecommunications and micros. Emphasiaing thia, Dr Ian Mackintosh points to the "sutomated office", and new medla markets. using video discs and integrated video/computer terminals, as

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aids.

Information technology, however, is a complex area. without the sudden simple and cataclysmic impact of some other more clearly defined technological breakthroughs. Mackintosh believes that there is a etrong argument for establishing an Inatituta of Techno-

more coherent framework to

This proposal is different from that of Inmos director lann Bar- cause it might be part of the ron who has, in the past, proposed the establishment of a Miniater of Information Technology. Mackintosh's Planning Institute would be an informed advisory body rather than an

Mackintosh emphasises the importance of such a body when he points out that, although he remains optimistic that in the long run information technology will enhance human activities: "The next 20 years will be certainly at least as significant logy will enhance human activtough while people come to

"Harnassing technology is now the graat challenga", he says, suggesting that while the recent glut of government support for microelectronics manufacturing and microprocessor applications provided the right basic ingredients for the future development of UK important that the government abould turn its attention to the

emiconductor industry. Mackintoah has been in the semiconductor industry since 1953 and was one of the earliest mambers of the brain drain when he went to Bell Laboratoriea in the US In 1956. By 1961 he was haad of the Westinghouse microelectronics

Among other milestonea in his career, he was reaponsible at Elliott for the establishment of what was, to the best of his the development of entire infacility in the

Having found that locating venture capital in the UK was next to impossible once that the word semiconductor was mentioned, and following an unsuccessful attempt to start his own IC company, Mackintosh set up ahop as a consultant specialising

and the US, and tha company

possibly elsewhere to provide a that any information Technoreplaca the current "random" opinion-forming process.

executive arm of government.

terms with technology."

He points to Japan, which has had a coherent approach to in-furnintion technology for a decade, as an example of the number of new jobs that can be created, given forealght.
"Harnassing technology is

the future development of UK induatry, It was now very markets that will provide the necessary synergy for the

resaarch division in the US.

By 1964 he returned to become managing director of Elliott Automation Microelectronics, a new operation that for a while put UK expertisa on a par with US manufacturers.

of semiconductors anded whan the Elliott Automation group. was takan over by English Elec-tric, which already owned Mar-coni. This latter company had a new, large eamiconductor plant at Witham in Essex. Eiliott's plant in Scotland was closed

In this growing industry.

He now employs about 70 followed thas lines could do and the US. and the CK, Germany much that was northead and the US. has developed an extansive intosh fait: has developed an extansive intospital.

databass of five year rolling. In particular, he disagreed. Though the same ingredients forecasts that cover not only with the suggestions put for prevailed in the UK at the same semiconductors, but all areas of ward by the Science Policy time, the US had one fundamental electronic use and application. Research Unit, in a report for the tai advantage—far larger man

systems such os word processors logy Planning Institute that would decimate office employmight be astablished would face ment (CW, October 5, 1978). considerable problems. One of "Just look of the fantastle prothese would be credibility, bespects for alectronic mail systems based on communicating public sector and could there-He is also sceptical about some fore risk becoming somewhat removed from reality by losing suggestions that the micro could direct contact with market be the root eause of political

inrest. "I have been aware since It should not consist of the I was at Elliotts that technology. properly used, was a means to setual decision makers, "Rather, it should be a sharp-end think economic, and therefore social tank, and therefore it ahould and political, stability. losa its job if it gets things wrong, just like any consult-

The activities of the UK. French and Weat German vernments over the past year suddenly waking up th microelectronics and the microas the development of the tranprocessur have been of particuinterest to Mackintosh. sistor and integrated circuit. The

> MACKINTOSH ... the next 20 years will be tough while people come to terms with

technology

only difference is that it is not as eatsclysmie; it is more an

One of the aims of a planning institute would be to encourage knowladge, the first significant dustries that would be based on technology. That, he felt, would then naturally provide the markat-place for the now wallsupported microelectronics in-

Such industries include the obvious selection of consumer systems, telecommunications and office products, though Mackintosh finda a growing difficulty in drawing lines of distinotion between some of them.

"Telecommunications, office products and computers, for example, are becoming so interrelated thay are almost a technological continuum, and this will be the industry of the fu-

much that was positive in terms of future employment, Mack-

time.

He also has reservations about the government's Mapon For ject, especially the (2,000 should be sho On the much published for mation of the NES held in moa. Mackintosh is in His company has bean directly involved in stirring up the hornets' nest of the past 12 months, having been asked in 1976 by the West Germans to produce a study on the state of the West German semiconductor in-

some corporats connected to ween Mackintosh Consults and Inmos, one of whose tors, Iann Barron, is the four ellent study, as the West Germans were keen to see a cotors, Iann Barron, Is used to the land always held that the had always held that there was merit in it that there was merit in it existence of "British Serior ductors Ltd", with sont learns with sector funding. ordinated European posture. The UK, France, Holland and the European Commission

Mackintosh and his ataff studied the technology, markats and strategy, aiming to define the ingredients of success. One of the early conclusiona was that vernment support, to at least the same level as the Japaness,

was essential to succeed. The study pointed to the reasons behind the success of the US semiconductor, industry, which stemmed from the coincidental emergance of the that the probability space industry, the growth of was high the computer industry, and the burgeoning of the new alloon been one of the text of the second of the second

economies of scale for profusi semiconductor manufacture.

By 1977, the study was & ished, and the West Germe went promptly loto action Set mens bought US semiconden manufacturer, Litronix, and ininority stake in AMO Phil in Holland had already bout

In the UK, things moved mer

lowly, and it was the end #

1977 before the first whispend

government activity were band

the study highlighted were co

summer electronics and takes

munications. Both offeren.

ernble notential for a Europe

semiconductor industry was

tereact with, and in the cue!

telecommunications is less it

protected market. This care

Europeon companies will

in the end, no co-quit

Eurnpean posture develor

which Mackintosh regrets

believe there are some gre

virtues to pan-Europeant operations", he said, and ing

that the three principal and are going separate ways. his: now clear if the market a: support all of them. for the

can't all be in all product areas

whot the UK government should be doing, Mackinton de delighted with the activity to

for, especially in the support

applications as well as semico ductor manufacture. He dos howover, odd that it all shock

hove been done eight years at something he suggested at the

right direction."

pleased with the develop

public sector funding.

The only Mackinight constitution with the Inmogration

came at the yary deglar when the company was the

when the company missioned by the NEB to proposal put to it by

Notwithstanding his views:

ferential advantage ord

competition.

serond source agreements.

AMC is 60% owned by Siemens and 40% by AMD and under the agreement AMD will buy out Slemens' US interest in AMC and Siemens will buy out AMD's interest in the venture in

West Germany.

ADVANCED Micro Devices Inc ond Siemens AG of West Ger-many have agreed to split up

their joint venture company

Advanced Micro Computers

formed about 18 months ago

(CW, October 13, 1977). The de-

cision to split was made in an

effort to avoid a conflict of ini-

crest between the Z8000 and the

At the time AMC was formed. Siemens also agreed to buy a 17% stake in AMD, becoming AMD's largest single sharehnider. The agreement also menot that Slemens was represented on the board of

A stateoreot Issued by both Siemeos and AMD stated that the restructuring was appro-printe in view of the different marketing objectives of the two companies In some arens of their respective microcomputer activities.

When plans were first revealed for the joint venture it was seen os a means of sharing expertise in development work for incrocomputer systems, systems componants, and software products. Early products were expected to be based on 8080 processor devices (CW, November 24, 1977): At the time both companies held intel

Launch of user group MORE help for businessmen and professionals in coming to grips An inaugural meeting is plonwith the use of mileros is on its ned for March 29 at Digitus, way with the formation of a Dumbarion House, 58 Oxford

behind AMC split

technical exchange and crosslicensing agreement with Zilog

which enabled AMD to he an

alternative Z8000 supplier. AMD is helleved to be developing certain peripheral circuits with

Zilog. Earlier to the year AMC was

manufacturing and marketing AMD's System 29 MPU deve-

lopment system and a aeries of

8080-based boards formerly pro-

micro users group. The group, Mleus for short, is almed at amail businesses, departments of large companies and professional practices, such us accountants and architects, who plan to use or are using microcomputers. The inlilative has been taken by the Institute of Data Processing Management

### **Bel backs TI 9900 course**

A NEW training course on the TI 9900 range of microprocessors is offered by Bleasdale Computer Systems Ltd. The training given is designed to provide the participants with a good understanding of the design and development of microbased systems.

The hardware has been designed to enable systems to be built similar to those the attendees will be huilding on leaving the course. Instruction covers the aspects of software design and development necessary to control the operation of the burdware.

The courses are backed by the Department of Industry, For rther details contact: Course Systems Ltd, 7 Church Puth, Merton Park, Lomion SW19.

were entirely transferred to

AMC, the boards marketed from

West Germany and the systems

It is thought that a new

second source agreement be-

tween Slemens and Intel Is

Imminent in which Siemens will

hava access to 8088 masks. Sle-

mena will also develop peripheral circuits for the 8088.

Street, London W1, at 3 pm. The

nines of the group are expected

to include the provision of ad-

vice and information, the ex-

change of software and the pro-

vialou of special offers and dis-

counts on software and hard-

ware. More details can be

Digitus. Tel; 01-946 5916,

obtained from Alon Wood at

from the US.



Conflict of interest
behind AMC split

Motorola's Euro marketing move

JEDY SABAN (left) has been appointed marketing illrector of Motorola semiconductors in Europe, based in president and worldwide direct Semiconductors in 1962 as export sales manager. In 1988 he moved to Fairchild as director of in-

DEDY SASAN (left) has been appointed planning and in 1970 he marketing director of Motorola joined ITT Semiconductors as vice-semiconductors in Europe, based in president and worldwide director of mar-Geneva. Saban first joined the company in 1962 as export sales manager. In 1988 Saban held key posts with Cramer Electronics and Solid State Selentific.

### CW's micro show bigger in 1980

VIBITORS from ebout 30 cou tries went to Microsystems 79, the second annuel exhibition end conference simed at bridging the technical gap between the makers and users of croelectronica (CW, February 8, 1676). The 3,656 visitors

epresented e wide ronge o industry and professions, in-cluding accountancy, distribu-tion, all types of anginearing, monufacturing industry, transport and wholeseling. This succossiul aeriea will be

ontinued in 1880 when I moves to the larger Wemble Conference Centre, London Microsystems 60 will be hel from Jenuery 30 to Februory 1 1980. The Microsysteme series is organised by IPC subsidiary little Promotions of Dorset House, Stamford Street, London, SEI CLU. It is aponeored by several IPC Guainess Prose journels including Computer Wookly,

#### Off the peg

Memec Systems to run on Zllog MCZ Systems. Text entered in unformatted form with embedded control characters produces paged text. Several options can he selected by the operator, including page muniformig

### Intel single board computer

A POWERFUL aingle board bit 8086 CPU (up to 48K hytes of computer based on the 8086 . memory), dedicated parallel I/O, CPU has been introduced by In- and a serial communications Inboard is claimed to be a replacement for four standard and can be expanded using any minleomputer boards in a typical OEM system at about

The ISBC 88/12 comprises 18-

tel. Called the ISBC 86/12, the terface. It is plug-compatible with the standard intel Multibus iSBC expansion card, such as RAMa up to 64K bytes. The boards ore available

from GEC Semiconductors.

### **Exchange clubs urged**

CLUBS should be formed under Secretary of State at the De the negls of resourch associa- partment of industry, at a tiona to encourage the exchange of Information between companies for their mutual benefit in the application of microelec-

This action was arged by Les-lie Huckfield, MP (Lab, Nuneaton), a Porlinmentary UnderDirectors of Research Associo Representatives of senior

function held under the aus-

pices of the Committee of

management from the engineering industry attended the

#### Flight simulation contract manufacture of the WG 34

MICRO Consultants have been nwnrdcd a contract by Westlond Helicopters to supply 10 Intellect picture generation and processing systems. They are to be systems during the design and synthetic displays,

helicopter, the planned replace-ment for the Royal Navy's Sea

It will also supply software used in the simulation of avionic for the generation of complex

### TEXT formatting software is s4.5m wafer plant expansion now available ex-stock from

manufacturing plant in Ohio. Ised production equipment

INCREASING worldwide de- US. The plant, to be completed mond for more complex silicon. In 1980, will increase capacity epitaxial waters has led to a for the production of walers planned \$4.5 million expansion. Some of the Investment will be Cincinnate Milagran's on the development of special

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THE first real test of the government's reluctence to breech its own pay

guidelines end comply with the results of e pay survay showing that the public sector hea fellen way behind in the pay ROBIN WEBSTER: With the CPSA and the SCPS represen-

ting the two largest Irade union bodies in the Civil Service, the amount of damage you could inflict on the government la en-ormous. How far are you willing to go to win what you feel are the correct and long overdue pay increases for your member-ship?

KEN THOMAS: Well, there is a paradox at work here. Some people think that we have no muscle et all, but the real problem is that we have too nuch muscle and therefore cen't use it. We have a responsibility to the country and therefore are using our power aelectively and carefully. Both the SCPS and ourselves are complementary. If we took strike sction without their membership's support and they went in to work it would. ruin anything that we had planned, and vice verss. So what is unlane in this situation is that this time we are working together. Between us we confro a number of very important

RW: Under the terma of your current action, you have pulled nnt only 2,000 people between

stakes was the one-day etoppege lest Friday by the Civil and Public Servents Association and the Sociaty of Civil and Public Servents. On the eve of this hammer-blow to what these two unions view as the "ruety wheels of government machinery" Ken Thomes, general secretery of the CPSA, discussed with ROBIN WEBSTER the logic behind their decialon

# Why we are bringing the government of the country to a halt....

key people in esaential areas. With your eye to your responsibility, how much care are you taking to ensure that the effects of the strike do not have any long-term impact on what might be called "innocent" arees?

KT: We have made it shouldely plain that we are not going to affect the alck, the needy, the unemployed or the old. They are not going to be involved apart from the one-day strike. This is because the Civil Service is res-

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🛨 Blinking ,

thing is that after making sure RW: Details of your claims have that these areas are not dis- been issued on the basis of the rupted, we are going to hit what PRU results which you have machinery of government", but increases you are fighting for which I suppose can be better referred to as revenue collection. The sffect, one would hope, and this is our Intention, is that the ordinary man in the street will not be troubled significantly.

But the real pity is that while the one-dey strike is not to bring the country to a standstill, but to show our power, the importance of industrial action is its threat, not its implementation. I have deaperately striven to use the threat of it to bring about a negotiating situation, any my regret is that I haven't been able

RW: What sort of co-operation heve you had from other Civil Service and associated unlons? Have they been optimistic or peasimistic of your chances of success? KT: I don't think one cun ex-

press It that way. Each unlan has to decide its own policy in relation to the will of its members. I never criticise other unione for thia reason. As I asld In one recent circular, my members span those who say, for example, that we should call 21-year-old typist who has just a atrike and stay out indefinitely, and others who aomehow belleve thet sweet resson will always prevail, Now, I think the Civil Service trade union movement reflecta those extremas. What we ere doing, however, ia to look at the bulk of our members, who, after all, have been bslloted, as the TUC concordat with government says thia ia the correct way to consult members. By 2 to 1 my members have said "We've had enough" end that is the ordinary lade, not

RW: At a recant meating with Lord Peart, Lord Privy Seal, you raieed the point that the government brought indepandent pay comparison, in the form of the Pay Research Unit, back into action but sa yet have refused to implement the results of the latest comparison survay. Whet was Lord Peart'a answer

KT: All he eald was that they (the government) would be prepared to implement it but it would have to be ataged and we ahould negotiate about staging. . That really doesn't tell ua anything. It eeems like en edvence but it really isn't, it is what we were told before; that we can have pay research back but we'll talk about its implementation. They said that 12 months ago

and we heve not got sny further. RW: But wasn't the agreement made on the besla that by bringing back tha PRU, Its research would actually be used n negotiations?

KT: It's as simpla as that. Indeed, e pay board was eet up to supervise the collection of the information end to ensure thet which has long term effects nobody was on the fiddle. That and to which psople won't wake pay board exists and is now examining all the avidence produced so that it can give a seal of duced so that it can give a seal of approval a public decigration, at up something that is already that end which seys that there taking place.

ponsible for the proper running of the welfere state. The second were collected fairly.

technically called "the analysed. How closely do the relate to the PRU figures? Are they exactly the same or some percentage amount?

KT: The effects of Incomes policy over a whole range of psople have been veriable. I believe that the low paid auffered and I also believe that senior management suffered. In the middle range, somewhere or other, there is probably less effect seen. Because our systam is sophiaticated and camplicated It is not easy for me to talk about a 14% increase or a 15% increase. What we do is to look et each grade in the Civil Service and

RW: So what you really are de-scribing is a disease within the Civil Service, the symptoms of which are quite far ndvanced?

KT: Yes, that's right. What we are saying is thet unless somebody actually applies some medicine to the situation in the Civil Service the patient will be dead. We will have catsstrophic problems because whether people like it or not a large part of economic, social, and welfare life in the country is involved with government, and much of that day to day routine drudgery work has to be done hy thousands and thousands of civil servants, whom the public basically dislike. Now if you haven't got staff to do that then

We don't went to do any better then those in the private sector. We don't went to set ourselves up as en elite. . . . The privete sector has tangibly broken through the pay barrier by ell sorts of methods such es productivity bargeins.

each point on each grade and you gradually get o creeping say, for example, 'What does a altuation where one day come in with X skills get, and what does a typist after 15 years' service in an outside firm get?' Therefore every point on every scale is exemined. It le an enormoualy complex exercise.

So when 1 talk in terms of my membera of eround a 20% cloim, I'm telking about a range thot lles on either side of it. I don't want to give my members the impression that I will put in a 20% dalm for everybody. Some will get 14% and others will get 22% depending on age, experience and qualifications.

RW: Dn recrultment, Campbell Christie, deputy general accretary of the SCPS, has asid that the problema of etaff was-tage and the finding of new per-sonnel, are terrible. What trend has emerged within the CPSA?

KT: In my grades, the problems are even more appailing, because on the official figures my basic grade, which is called clerical assistant, is likely to sea a 50% loss in the next 12 months. The turnover has always been big in thet grade, around the 15% to 20% mark anyway, but the problem is that no one can actually give us any assurance that if we do lose this 50% we will get anybody back. Even if we get an increase in pay now, there is still a time lag before that works Ita way through the system, and there is

the sided problem of training. Dne of the greatest tragedies is that in the end I suppose one would say that we wouldn't need to take industriel action ae people leaving the Civil Service are in fact creating a form of industrial action themselvee

altuation where one day somebody will wake up and find that the whole of Social Security benefits and employment bencfits, the machinery of government, is not working. Then there will be penic. RW: If the government's inter-

nol computing copacity col-lepsas, what will it do? Will it go outside for help? KT: Well, If it trics to use externel orcas to prevent nur strike ection taking offect, then we are in touch with other unions and we ore cunfident that they would black nny work which normally would hove been per-

formed by my mombors. RW: So there la no bock door for

to Taiwan or some place but prospects of doing it by any in that employs British into

unionists is, I think, very small

KEN THOMAS ... "Theye willy

but aqually you can't bi lift is

RW: What effect will all the troubles have an the device ment of the government ri total entity?

KT: I am sure that we are led with a great shortage pair, larly in the highly technology areas such as programming? other data processing at levels, and that stands with very important too, baz ever since camputerm; started the Civil Series: been a very intelligent and computers and is inflated: of the use of computers; clerical work. Almoster' as an institutian, we kee computers than anyone:

HW: So what you are fight for then is better pay, less people because of bette for and hetter devalopment beas of more people?

KT: Yes, what we are sing

and it's an old cry for those

work in the public sector, is the we don't want to do any but thon those in the private xi we don't want to set ourseld up us no olite. What we is suying is that the private sch hns thinglbly broken through the pny barriar by all seris d methods such as production borgains. So for the same safe work the private self-employees are doing for helf. and while ws don't wall beat them, we want to be the beat them. Many of my member both it's o lousy system will icod . . . and i have select RT: I don't think there is et all.

They may be able to form it out

### MICROSEMINARS

16-BIT MICROPROCESSORS THE NATIONAL COMPUTING CENTRE MANCHESTER TUESDAY, MARCH 27, 1979

The increasing availability of 16-bit microprocessors posts the System Daelgner about the autability of longer word length and differences between manufacturers products.

The seminar examines the range of processors considerable selecting an M.P.U. end examines especia of applications. The seminar is one of a serial concarned with microprocessors and applications. Each seminar is relevant to designed involved in using microprocessors and will also be of involved in using microprocessors and will also be of involved in using microprocessors and will also be of involved in using microprocessors and will also be of involved in using microprocessors and will also be of involved in using microprocessors and will also be of involved in using microprocessors.

SEMINAR BOOKINGS
JOAN SEATH
THE NATIONAL COMPUTING OFF
OXFORD ROAD
MANCHESTER, M1750

### Perkin Elmer adds to its menagerie

AN Intelligent VDU warkstation that can be programmed in Basic will be introduced later this manth by the terminals division af Perkin-Elmer Data Systems. Called the Beaver, It comes with integral floppy disc storage, provides graphica facilities and

tam, o teletype replacement

Bantain fentures an LSI chip that was designed by Perkin-Elmer itself with the alm of dramatically reducing the total number of circuits in the terminal. The total is 19, compared with 100 in the esrlier VDU model that employed a general purpose microprocessor.

Bantsm, Puasycat, Owl and Beaver ore otherwise known respectively, as the 550, 650, 1200

Other Beaver festures include a movable keyboard, a tiltable display, bi-synchronous communications and a range of ter-minal emulators. The floppy disc storage takes the farm of two mlcroflappy drives each holding 80K bytes. The Basic is Anal standard with scientific and cammercial extensions such as double precisian arithmetic and string manipulation.

### **NERC** and SRC in joint network

COMPUTING services for the Natural Environment Research Council are being enhanced by the setting up of a Joint network with the Science Research Council to serve NERC'a widely spread Institutes, and by the unification of all the council's computing facilities under the direction of Dr Brian Rule, who st present works for Honeywell.

One of NERC's two existing mainframes, a Univac 1108, is being moved from Wallingford to Rutherford Laboratory where it will be run by SRC staff as part of the network which will include SRC 1BM equipment aa

NERC is also spending about ti million on minicomputers for links to the Institute of Geogical Sciences in London and similer establishmenta in Keyworth and Edinburgh, and e GEC 4070 has been bought for a quarters information sys-non-specialist users to edapt e set of basic packegee to their

are to share e redundant ig M 1800 minleomputer which



The basic system including

### Making the going easier the vehicle wheals as transducers, is mounted an each of a pair of asially opposed wheels to semple vertical, longitudinal, and lateral

WiTH taday's high-spead passenger transport, Gritish Reli has had to daviso new woys to investigate the forces piscad an train wheels operating at speeds of

up to 130 mph.
Previously, information relating to this was collected offline by sttoching moasuring devices to the whosia end undorcarriage thet coilected raw, unprocessed data. This was leter fad into a mainframe tar analysis. But now &R is using a peir of Miproc-19AB miorocomputers from Pioessy Microsystems to do the job in rest time. An array of stretn gauges, using

new System 38. Level 62 has

done well, particularly in the US.

as a replacement for IBM's Sya-

tem 3, the market for which

while also providing a real time display of activity via a chert ecordar or other equipment. Cammissianed by 8R's research

PO's modem

supply

end dovolopment division at Derby eyetem herdware consists mainly of standard Miproc modules, but some speciel hardware was dave-loped for the application.

The Miproc-16A9 systems log

anti pracoss ali this informetion

# Integral floppy disc storage, provides graphica facilities and costs less than £2,000. The Beaver will be added to a group of Perkin-Elmer terminals with animal namea—the Pussycat VDU output printer, the Owl VDU editing terminal, and Bantam, o teletype replacement BDU that costs less than £400 in quantities of 100. CII-HB revamps bottom end of its Level 61 line end of its Level 61 line

The new Nippon Electric Acos 77/250, revealed last week

(CW, February 22) has turned

able bottom end Level 61 line has been announced by CIIone workstotion, the operating Honeywell Bull. At the same system and Cobol compiler costs time the French company has 150,000 francs, about £18,000, out to be a major enhancement in very compact new technniagy reorganised its computer busi-ness into two nutonomous divifrancs. Level 61/DPS is an- of the 77/200, which is based on sions, one handling "systems nonnced for CII-Honeywell Bull the Honeywell Level 62. Honeyand networka" and embracing tarritory only and first deliveries well declined to say whether on Level 64, Level 66 and ex Cli and are set for the third quarter of Italian version of the new System 38 is designed. Unidata computera, and the other for mass market products, taking in Level 61 and Level 62 for end-users, and the Level ( minicomputer for the OEM

Called Level 61/DPS, the new system features an innovative dual-processor architecture. with a common resources processur, CRP, doing the computntlon, while a distributed resourcea processor, DRP, handles the peripherals and up to 16 workststians.

Each processor has Ita own main memory and a ROM which constantly monitors the performance of the other. The CRP comes with 64 ar 08K bytes of 16K blt main memary, and two pleces of microcode. One carries the 114 instruction set and test routines for the DRP, and the other contains resident parts of the operating ayatem, teat routines and integral disc con-

The DRP has 24 or 56K bytes of main memory, and two more pleces of microcoda. The first carries test routines for the CRP and the processor's 110 machine Instructions, and the eecond, 8K bytes of supervisor memory.

It also includes diekette controller, synchronous line controller, and the asynchronoua line adaptor for the 18 terminals The link between the processors runs at 50K bps, which can

handle messages from ell 16 workstations almultaneously.
The disc capacity ranges from 11 to 230 Megabytee, end the 61/DPS takes one or two

printers, with spseds up to 160 cbpa sod 800 lpm. The operating system is a supersat of GCOS-61, celled GCOS 61/DPS, end supports three programming languages: Cobol and Fortran compilere and a Basic lotarpreter. A soft-

### Saved from scrapheap

Southern Gaz has been using for analysis work, but is now rapiacing. The 32K, 18-bit which the teachers feel will give a machine is being installed free big boost to motivetion among in a classroom at Barthalomaw

School Eynsham.

School Eynsham.

Pupils from several nearby

Pupils from several nearby schools will be shie to use the machine and have their first axperionce of hards on computing, which the teachers feel will give a

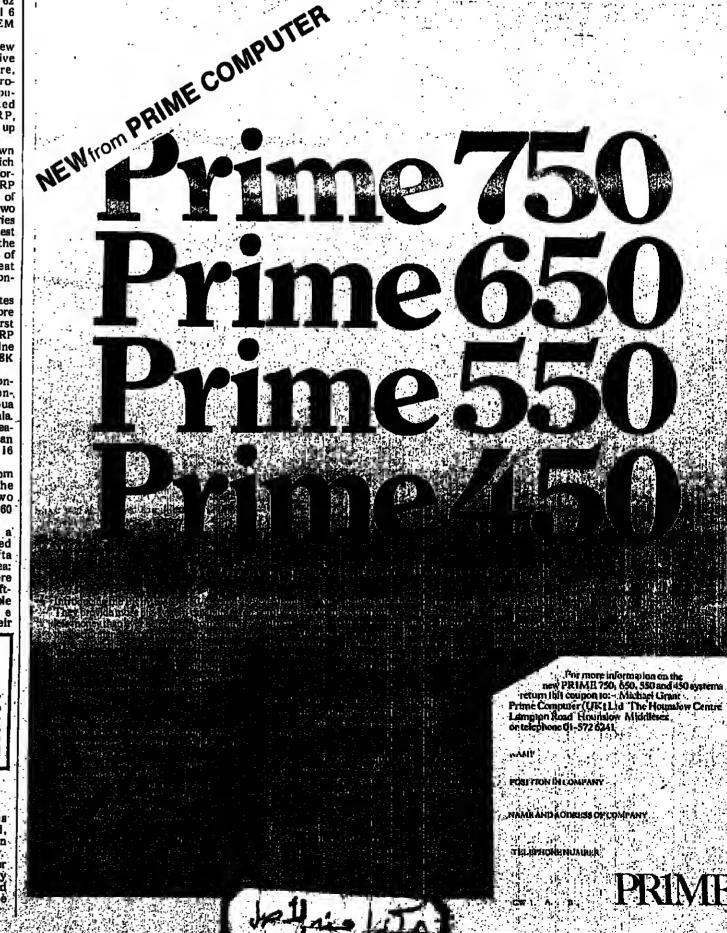
### System X company named

ilses (CW. January 25) hea been registered by adother company.
Issued United TelecommunicaAt present managing director.
At present managing director.
Identification is the sponsors were of two directors from each of the sponsoring organisations.

Post Office, Plessey, GEC and Ltd without the United, 1980s (Cur vit System X in the although it had already been

#### improves European and US markets, but the company will need to enhance Level 62 further if it is to compete effectively with iBM's

SUPPLY of the Poat Office's Modem 12 to users of its 2.400 bps Datel services is now iniproving as a result of the Post Office doubling the order from the maker, SE Lnbs, to 200 a month (CW, November 30, 1978). A Posi Office spokesman sald that the delay being quoted to customers was now heing cut from the six months prevaling



FOLLOWING the National En- Boord, the programme forms

### IBM replies on French investment

(CWI, Februory 15) carries a report on IBM's European Investment in manufacturing, that warrants a reply.

First, the headline of the report, "IBM hits back by cuting French investment," leaves the casual reader with the Impression that such cuts are a fact. That is simply not the case. IBM France's manufacturing investment has continued to

### Sibas, Nord-10 disc capacity

surveying minis on which database management eystems can be run (CWI, January 11), there are a number of details about the Nord 10S and Sibae which need to be corrected. These ore concerned with what Slbas canmanage, and the disc capacity of a Nord-10S system. The maximum disc capacity

quoted for such a system is much too low. Nord offers dlac packs of 288 Mbytes, four per controller, and two controllers per machine la about 2,300

Megabytes.
This is still less than what Sibas today can manage. At present Sibas uses a 25-bit word addressing within a realm, and one database can contain 62 realms. Thus the maximum atorage capacity of a single database is 62 x 22 words, about

4,000 Mbytes.
Sibas-80, now in the test phase, addresses records, and each realm can contain 224 records which will increase the maximum volume/database considerably.

Sibas was implemented as a virtual database machine in 1974, and is now frequently mplemented as a real back end machine in a multimachine system. An actual application can have a logical database capacity far in excess of the limitations mposed by Sibaa or Nord-10.

However, it is possible to upgrade to a mainframe since Sibas runs (admittedly just as a hatch system, singla usar) on IBM 370, Univac 1100, Digital Equipment DECsystem 10 and CDC machines.

Finally, a comment or two about virtual store and relatiovirtual store technique since Its implementation in 1970. Apy Sibas implementation has a core buffer whose size is installation dependent. The database is paged into this core buffer via a software paging system, and the grow. Evidence of that is the 167,000 sq ft extension currently under construction at the company's Montpelller plant.

What you ignore is that iBM Germany's laboratory in Boe-blingen played a significant role in the development of the IBM Second, you base much of your speculation about possible reductiona in IBM's manufacturing growth in France and Italy on the fact that the IBM 4300 series is to ba manufactured In Mainz, Germany, rather than In either of the other two coun-

4300 series, and the Sindelfingen

componenta plant is heavily en-

gaged in the manufacture of

much of the associated techno-

These factors, among others, played o major part in our decision to manufacture tha 4300

aeries at Mainz, a plant that has

extensive experience of Inter-

You also say that the decision

to build the IBM 4300 series in

Germany is a "ahot across the

bows of the Italian govern-

only has iBM's manufacturing

Investment in Italy grown

ateadily over the years, but only

two months ago IBM Italy an-

nounced its intention to build a

new plant south of Rome.

IBM Europe

May I point out that not

mediate systems products.

On a 16-bit machine the siza of this buffer, which is direct addressabla, is limited (about 64 Kbytes), but we are implementing a disc cacha techniqua which will increase it to about 800 Kbytes if required.

it is no new technique, and is used by other machines than Nord. Any claim to originality on behalf of IBM is as valid as the cialm that IBM invented virtual memoryl

The comments about screens and relational databases in Marketview abould be taken with a plnch of sait. You can't get much on an 80-character line, Inde-pendently of whether it is stored as tuples or records. Repeating groups are a normal "user view" things and they can be and often are represented in the Codasyl and relational approaches without storing them as such in the physical

record structure.

Query by example is an excellent screen-oriented interface to a database, but unless you hava acreens which can take much longer formats than 80 x 24, you will have considerable pro-blems preaenting all but the narrowest tables!

JEREMY SALTER Norsk Data AS

Fred Lahrond contments: in this fast-moving market specifica-tions are quickly outdated. For instance, the iBM System 38 capacity has also bank raised to 2,600 Mbytea sinca Marketview was published. Data given on the Nord aystent was basad on Iltarature distributed by the company at Sicob in Paris last Septamber. The table was only intended as a guide to the facilities available and in some cases only the range of machinas offering DBMS was named and not all the models.

#### CONFERENCES

PEOPLE and Systems — The Next Ten Yaars is the inems of a conference on March 29-30 in Saurnemouth. It is organised by the management services division of the lastitute of Administrative Management. Basking distaits from Pamets Martin, Courses Department, Institute of Administrative Management, 203 High Street, Beckenhum. Kent BR3 IBA.

AN education co-ordinators' workshop will be held from March 19-23, at the Monkey Island Hotel, Maldenhend, Berkshire. It is organised by BIS-Deliak and intended for those whose work involves in house training and career development programmes for date processing staff. Further information from The Registrar, BIS-Deliak Ltd. 17-23 Stamford Street, Loaden SEI RNG. Tel: 01-251 9766.

MANAGINO changing technology is the title of a one-day conference to be held at the Cafe Royal, London, on March 22, It is organized by BIS Applied Systems, and will examine various management approaches used to handle turrent leakle. Coillegs, tourse registrar, BIB Applied Systems, York House, 199 Westminster Bridge Road, London, Tet 91-633 0868.

BNCS 78 will be held in conjunction with the British Numerical Control Boolety nearest conference at UMIST, Manchester, from April 28-27. The theme will be the successful applications of NC in British iedustry, and the exhibition is organised by BNCS and UMIST and supported by the Institution of Production Engineers. Cooference and exhibition details from W. Al Smith, Manufacturing and Machine Toole division, UMIST, PO Box 58, Manchester M60 1QD;

PROPOSAL preparation and source selection is the theme of a two-day seminar to be hald at the Manich Hilton, Munich Germany, on March 15-16, and at the Royal Asconautical Society lecture theater, London, on March 8-7. The seminar is geomeored by the TMBA, RASS, and the AIR, and will feature Hyman Silver, inquiries should be made to the TMSA/RASS Proposal Seminar, o/o State of the Art, Victoria House WCIS 4PJ. Tel: 01-242 4045.

THE Scoillan Business Show will be held from March 1942 at the Kelvin Hall Clasgow. It is organised by BETA and Scotlish Industrial and Trade Exhibitions. Details may be obtained from Roy D'Uriso, BETA, 108 Kingsway, Lindon, WC2B SPU, ar William Taylor, BTFE, 24 Hartington Place, Edinburgh EH10 ALE.

To: The Editor, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU

### Training business systems analysts

article, Training of Businesa Systems Analysts (CW. December 14, 1978), your correa-pondent Judy Cox raises some constructiva points (Lettera,

If a systems analyst aspires to be a business systems analyst it is essential, as she says, that he gains knowledge of business skills to augment and widen his technical training, and hare can be tha problem. However, I belleve we can offar a solution.

Principles of business and in-dustry is the title of a course we Director of External have designed precisaly to meet the demand of DP staff in this

for systems nnalysts, deading more specifically with the identification and solution of problems in the business environ-

If we can help ony of your randers by discussing their needs we chall be happy to do so. ANDY HOWARD

### Can you help out this school?

THIS is a request to Cong.
Weekly readers to the Helph School give.
Heysham High School give.
Husiosm and knowledge, some of the potential cong.
professionals of the late kind Many of you must have to preparation and storage to ment which is out of date of the not work. By giving the week. not work. By giving the your leietype, card punch, ig-reader, varifier or evad ubont-to-be-updated compa you could halp to give our per "hands on" experience of the makes these machine it you think you can help the contract me at the address for

Heysham High School, Morecambe LAS IHS.

The Editor walcomes latters on subjects published in Cas putar Weekly, or on original topics. All latters must sccompanied by the writer's name and address, not see sarily for publication. All latters are lishe to be coint discretion of the Editor, unless correspondents sub it their lattars may not be cut.

# Computastars: don't miss NEL researches into to enter



ALL of last year's Computastars winners are planning to defend their titles and thera will be plenty of hard-fought contests for places in the Crystal Palace finals on Saturday, September 29. Thare will again be a strong overseas contingent with the SAS tenms from Copenhagen elming to take all three major trophiss.

Closing date for antries is Morch 10, so get your challange In as soon as possible by completing the sntry form right. Full conditions of entry will be found on page 4 of Computer Weekly, February 15.

South-West, Whitchurch Sports Crawley, Sussex, April 29; and invited to toke part in one of the North-East, Westcliffe Mount other orea heats if they wish. Sports Centre, Cleckheaton, All teams hove to compete in

near Leeds, May 13. The datas and venues for Thames North-Wast and East Auglia hove still to be settled.
The Scottish heat will he at

the Meadowbonk Stadlum, The dates of most of the heats Edinhurgh, on May 20 as long as have now been fixed and are as sufficient teoms in that area follows: Midlands, Alexander enter. Thera is also the possibility of en Irlah hent in Belfast. If there ore not enough Centre, Bristol, April 22; Thames teams for acparate Scottish and South, The Sports Centre, frish heats, contestants will be

Computators is jointly span-sored by Computer Weekly and

your chance We have road end accept the conditions of entry for the Computerators 79 composition and would like to enter men's teams warmen's teams in eli mestare ralaling-to tha rules end the composition, tha declaran of the organiser is finel places earnt this antry form to Computesters, 177b High Sweet, Creydon, Surrey Te 01-888 6890

> the heats to win e place in the finol except last year's winning inen's and women's teams who have been given hyes into the

Wright Air Conditioning, and organised by Computastars of 117b High Street, Croydon, Sur-Chequea for entry fees

should he made poyoble to

Department of Industry's will not be essessing the cost of Mechanical Engineering and Computer processing and com-machine Tools Requirement munications functions.

part of o research project being

Automoted Small Batch Pro

duction. Main activities will in-

clude the evaluntion of interfoce

and performance stondards and

the enhancement of robots by

While the use of micro- and

multi-processor systems will be

examined, the NEL saye that I

#### Brussels conference on international data flow

industrial robots

terpriae Board'a move in taking a 49 per cent stake in George P.

Brown, a manufacturer of robot welding and metalforming

equipment (CW, February 15),

the National Engineering

Laboratory in Glaegow hae be-

gun an 18-month research pro-

gramme into the development of

Financed specifically by tha

industrial robots.

THE impact of naw technology and legislation on international data flow is to be the subject of a conference in Brussels from April 24 to 26, organized by European Study Conference of Uppingham.

Several well-known figures from the international date flow scene will be speaking, including Gerhard Stadler from the OECD, governmental Bureau for Infor-motica, John Egar, formerly director of the US Office of

Recorve Bank will suggest that worksh harmonic EFT needs supervised and for slop and control, touching such lesues as the implication of mar-

tion will ergue that "information is a commodity in international trade," and Ricardo Saur from the Gerhard Stadier from the OECD, Brazilish government will discuss F.A. Berneaconi of the inter-the rights of States to control information arossing their

Talacommunications Policy, and consultant Adrian Norman.

Electronic funds transfer will be one of the meat significant topics dealt with, Poul Honderson of the New York Federal Reserve Carlo Will suggest that the consultation of the New York Federal Reserve Carlo Will suggest that the consultation of the New York Federal Reserve Carlo Will suggest that the consultation of the New York Federal Reserve Carlo Will suggest that the consultation of the New York Federal Reserve Carlo Will suggest that the consultation of the New York Federal Reserve Carlo Will suggest that the consultant of the Carlo Will suggest that the consultant of the Carlo Will suggest that the consultant of the Carlo Will suggest the Carlo Will sugg workshops.

Fee for all three days is £325, and for the second and third only,

### **Civil servants show teeth**

• From front page

repayments will have to wall

until the strike is over. Balance of trade statistics. ususally prepared at Southend,

will not be compiled either. Confidential communications handled at the Government Communications Headquarters in Cheltenham and coding/ decoding of communications traffic to and from overseas embassies at the Foreign Office have ceased too. The only union concession is the 'hot-line' to Washington which la being kept

And while both unions have highlighted that they are not out to get the man in the street, it appears that industry and farmers will have to bear most of

the brunt as far as government payments and subsidies are concerned.

About £206 million a week in tirese areas are being affected by action at Ministry of Defence centres in Liverpool and Chorley, at the Department of En-vironment's centre at Hastings; the Ministry of Agriculture's centre at Guildford; and at the

Scottish Offica in Edinburgh. Telex communications within some Department of Trade buildings have either been stopped or severely disrupted, and those hoping for a Premium Bond prize will have to wait until the strike is called off as at the Department of National Savings Centre in Lytham, is

though the system needs more

than 6,000 ledger cards; far more

than the Informer could handle

A Philips spokesman said,

agreeing to axchange the In-

partner is announced (CW,

January 11). "We are in finnlnegotiations with companies,

some in the business market and

some in the domestic, but i

insac's 12-man sales team is

also selling direct to closed user groups and corporations, and

has racelyed aeveral letters of

won't be drawn on timescales."

in normal working hours."

### System that was too small

AFTER complaining to Com- as our accounting work evan puter Weekly about the performance of its Philips Data Systems informer VRC, a user in Worcesterahlre, SMF Motor Factors of Stourbridge, has bean "Wa originally thought that tha SMF application would require only 3,500 corde. Our managing director has now written to SMF. offered a disc-based systam by

Philips in part exchange.
An SMF spokesman said, "We have never used a computer before and ws ware rather green when we installed the informer last August. Until now Philips has insisted that it could handle our atock control system as well

disc-based machines." This is to be done on a part-exchange **Prestel US agreement** 

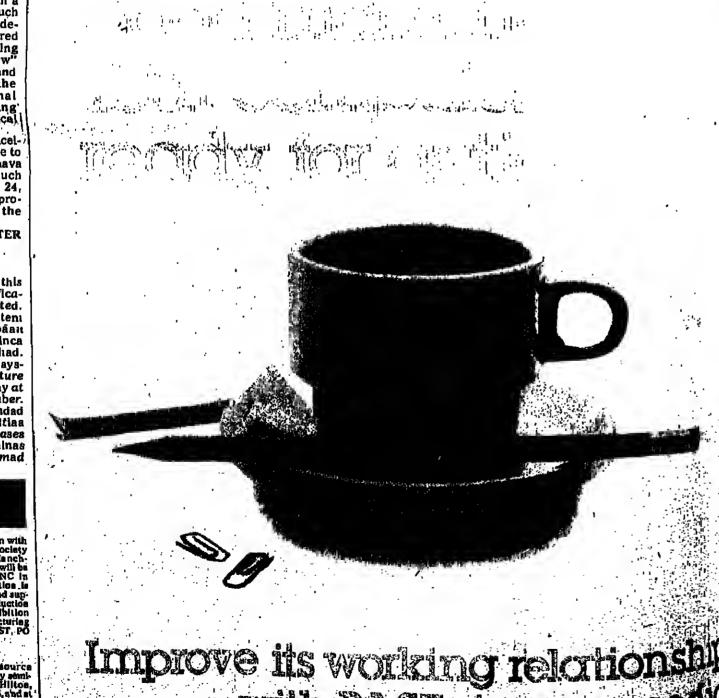
THE long-awaited formal licen-sing agreement batween the Post Office and Ipsac, covering the marketing of the corpo-ration's Prestel viewdata system in the US, has been signed. This has removed a major barrier to partnerships that insac hopes will offer viewdate services in the US by the end of the year. Insac managing director John has racalved several letters.
Pearce said that it might be two linear from potential users.

**Customs' faulty figures** 

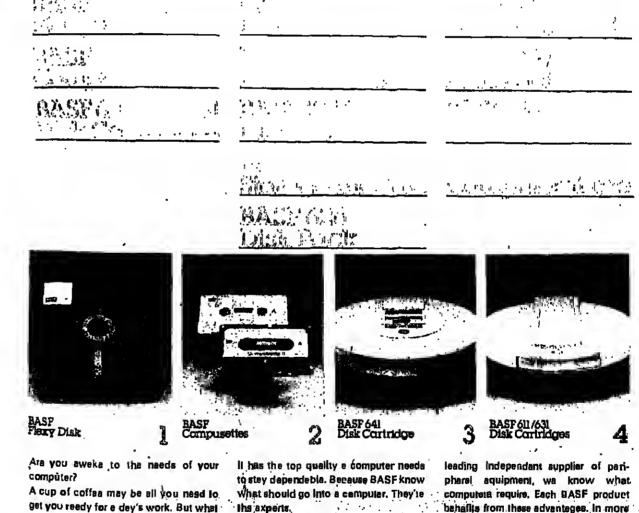
### • From front page

have been entered under a dif-ferent heading." But Customs is not yet: prepared to reveal the nature of the "Items" that have been incor-rectly included under the analog

guesand hybrid heading.
Customs sald, "At the conclusion of the inquiry a more accurate picture will emerge and details will be made known. A new figure will then have to be published."



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SENIOR SYSTEMS AOVIBOR Inn mein Irania manulactura. At laast 4 years' commarciel systems including knowledge al Cabat ar RPO 11. Arab' Loicestor ar Silitol. Selary: c £8,000 plus car ellowance and generous expansas. Rel.

SYBTEMS SUPERVISOR. At lazer 4 years in Anelysis and Pragramm

AYBTEMS SUPERVISOR. At least 4 years in Anelysis and Pragramming in RFG II. Knewledge of stock central or order pracessing applications an advantage. Area Redditch Salery to £6,000 Rel: SA199.

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PROJECT LEADERS & SYSTEMS ANALYSTS. Owing to expension our client its seeking 0.P Personnel et various lovels Areb Coventry. Salary To £6,600 plus general relecation package Ref. SA214

#### ANALYS IS / PROBRATIONERS

ANALYSTS/PROGRAMMER. At least 3 years' cammercial applications for IBM Systems 34 RPG II an easer but not essential, mainly Systems development work Area: What Bramwich. Selary Ta £8.000 Rat: P377 ZAMBIA ANALYST/PROGRAMMER, At loast 3 years' experience using IBM Systems 3 herdwers. Minimum period of centrect: 2 years. Salery negotiable plus expenses and camplerion gretuity. Rql. M48.

TECHNICAL SUPPORT ANALYST/PROGRAMMER. At feet 2 years commercial applications including Production Cantrol. Minimum. Magnifecturer. Area:

commercial applications including Production Centrol. Mini manulacturer. Areas estiming from Selony: c £6,000 plus campeny car and esperaes. Ref. SA 1 87. PROORAMMER/ANALYST. Required at least 2 yours working wish 18 M small maintene ar minis. Real-time experience essential for Pra and Past Sales Suppon work Area. Stalls. Selony. to £6,000 plus generous cer ellowance. Ref: P389.

EEMIOR ANALYST/PROORAMMER. With RPG II experience. Senior Progremmer without Analysis experience considered. Area. Rural Willshire Selary. Ta £6.000. Rel: SA180.

Selary. Ta £6.000. Rel: SA180.

ANALYBT/PROGRAMMER. 1 yeer plus Cobel at willing 10 ratrein experienced programmer in Cabal. Area: Cannock. before; c £6.000. Rel: P390

OEVELOPMENT ANALYST/PROGRAMMER, at least 2 years Cobel, small installetian. Area: North Birmingham. Salary. c £5.600. Rel: SA.220.

ANALYBT/PROGRAMMER, 2 years Cobel. Any hardwara. Area: Wolverhampton. Salary: c £5.000. Rel: P411.

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CHIEF PROORAMMER. At least 4 years in pragramming with good working knowledge of NEAT 3 at MUMPS. Areb. Stells Salery Ta £7,000 tldt: T.272 FORTRAN PROORAMMER. With roal time and instructive mini experience to work an Merketing and Production Cantrol Systems Parmanent or Contract pastien. Area: Swindon Salery. Nagasteble. Rel: P130.
PROORAMMER. Must have experience in S.N.A. using IBM Terminels Travelling throughout U.K. invalved. Salery: c £5,500 plus expenses. Rel: P400.

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PROORAMMER. At loast 18 pronths Programming in Cobol PL/1 or Assembler Area Burron-entrent Salory: To (5,500 ftel P367 BOFTWARE PROORAMMER of least 2 years Assembler experience with knowledge of Cobal Language Salary CE5,500. Ref: P410.

Same and the second of the sec

SYSTEMS SOFTWARS PROGRAMMER, 2 yesra' plun exparience using Univec hardweta under Executive 8. Aras. Wiltshire. Salery to £8,000 Rat:

#### and whereathous

OPERATIONS PLANNING ASSISTANT. Must have several years experience with IBM Herdware using JCL. 08 togather with a knewtedge of Soliware or packages. Areb. Stalls Salary. c £6.000 ftd; 5A178.

OPERATIONS TRAM LEAGER. At least 3 years' ICL 1900 experience with sound knowledge of George III. Area. Wiltshiro. Salary. c £4.500. Rel. 0136 OPERATOR. At least 18 months' Operating ICL 1900 under Ocorgo II or 2880 under OME Area: Lincolrehire. Salary: c £4.000 Rot 0148 SENTOR COMPUTER OPERATOR. At least 18 months using IBM 05 005 VS. Salary: To £4.000. Area: Birmingham Ret. 0148 SENTOR COMPUTER OPERATOR, at least 18 months operating IBM 370 under OOS/VS. Area: Sirminghem. Salary package: £5.000 plus. Ref. 0158. COMPUTER OPERATOR/OATA CONTROLLER et least 2 years' Operating/Data Control esperience. Any herdwars. Area: 0 loucestarshira. Salary: c £4.000. Ret. 0159.

Stary: C tA,000. Ref: 0159.

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CHISF OPERATOR at least 4 years' operations experience using ICL 1800 range under Executive and George II. ebility to augarvise stell at verieue levela. Area: Olaucestershire. Salery: negatiable. Ref 0180.

NETWORK CONTROLLSR, experienced in on line natwork control. Area Oloucestershire. Salery: Negotiablo. Ref: 0181.

### Contact: Graham Aston, M.E.C.I.

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N taking a look at the opportunities in data pro-cessing in the North it is worthwhile considering the general market situation as a prelude to looking more specifically at the area.

in general terms the market-place appeors very

senior management positions, where the competition is always intense, there

suitancles or client companies alike.

How than do the job candidates to fill the vacan- criteria?

neceasarily in order of velopment of the latest priority, that the major fea-technology. tures to be considered are: Thare is a comprehensive

1. — The general back- range of installations

else—on offer in the North thia can require consider-With the exception of able effort on behalf of con-

would certainly seem to be opportunities in the North more jobs on offer than measure up to these key To deal firstly with the When considering the general background, the

opportunities in any area North does not lag behind and acknowledging the any other sector of the UK shortage of experienced in these respects. Throughpersonnel, it is worth men- out the region there are tioning the major features numerous examples of very for which candidates are progressive companies which are at the forefront in I would suggest, not the use and continuing de-

ground, which includes covering all the main hardjob content, career path, ware - mainframe, mini equipment, technicol and including quite extens- to advance their careera largest and most wall devecontent and the level of lva use of distributed pro- whatever their preference commitment of top cessing techniques. Thus in tarms of company management to data pro-cessing. technical terms there is no activity and hence the type difficulty in satisfying any of applications on which cessing.

2. — The financial conparticular candidates so far
as the hardware with which

There ia siderationa including as the hardware with which

any company a data processing department must be the aspect of aervice to the corresented, including the aspect of aervice to the corresented, including it is important to consider the only opportunity titley in the only opportunity titley is including to the only opportunity titley in the only opportunity titley is important to consider the only opportunity titley is including in the region of the only opportunity titley is including in the only opportunity titley is including in the only opportunity titley in the only opportunity titley is included. organisation, and the types chain store operations, carefully the financial to buy a house.

There is a wida spread of commercial, financial and located in this region, the Industrial organisations, retail trade accounts for

The author, who is managing director of ivor Norton Mansgament Services Ltd, of Harrogate, says the North is able to offer a wide choice of jobe involving most types of hardware, and covering a range of systems spplications to suit most people's tastes - end the area has much to offer over and above the

ia much the fore. the recipient.

Acknowledging that cangles plenty of opportunity of the industry there is also come into play, in also come in factorily met then, even in farence for a particular specialise or gsin ex-sales executives and for candidates who wish to While it is possible to dis-

of organisation in the re-glon should be mentioned. multiple retailing and mail aspects. order. As some of the major Much

Finance, banking, insu-

rance, building societies, public utilities and govern-

ment bodies are also well to

muted and the significant cost of ao doing. Generally in the North people seem to £6,300/£7,000. ve much nearer their place of work, probably because they do not need to go a

today's market-place, can tha major consideration in duction control and Having given a brief at the early stages of their systems development terms of water and the major consideration in duction control and Having given a brief at the early stages of their systems development terms or is it Watford?

Much has been said and muke catagorical state. not that much lower. names in the country are written shout the differen- ments about salurles hetials in salary levals in different parts of the country ever the salory one quintes it volue for one's work mi and therefore considerable some major instaliations some alied to the cost of living in can always be proven that in effect there is some acope for professional staff which represent some of the various areas. In general wrong in a subsequent and money left overlog provent allied to the cost of living in can always be proven that in effect there have terms the cost of living is vertisement. However, as a and leisure spending Ad." definitely lower in the guide the following are I here the Northern reservoir think reasonable market in has plenty of areas of site. particularly compared with dicotors: Programmers (t ral beauty - the Lake) the Greater London com- year Cobol), about £4,300; trict, Peak District and first muter srea, are much lower programmers (2/3 years). and offer better value for about £5,000/£5,300; senior programmers (5 years). Hand in hand with this about £6,000; systems anagoas the distance com- lysts (3 years DP), about and the environments £5,500/£6,500; senior ann. clean. lysts (5/6 years DP), about

generalisation such as volving most typesday "North of England" there ware and covering ing long way away to be able to can he considerable varia- of systems application buy s house in pleasant tion in these figures, but suit most peoples in suburban or rursi surroun- they represent the level that needs to be offered and Underlining the differen- which candidates can ren- work, and speaking a For people interested in that in reapect of housing aonably expect to receive. immigrant from the & solary levels and the they wish to work la con- activity in the manufac- For people interested in the tital in respect to housing anomaly expect to receive. Immigrant tollinks as solary levels and the they wish to work la con- activity in the manufac- For people interested in the in respect of housing anomaly expect to receive. Immigrant tollinks as solar tollinks and the they wish to work la con- activity in the manufac- For people interested in the in respect of housing anomaly expect to receive. Immigrant tollinks as a language of the fact that my various additional factors no longer believe that a language of the fact that my various additional factors no longer believe that a language of the fact that my various additional factors no longer believe that a language of the fact that my various additional factors no longer believe that a language of the fact that my various additional factors no longer believe that a language of the fact that my various additional factors in the fact that my var

Plenty of work—and much Finally on the question

money, I am very much d custs, general living on taken fully into account then the difference in salar reflect those factors in the It is dongerous to the salaries in the North

it is not so easy in the car of sales jobs which alter total packages in the £10,000 to £20,000 range is pending on serious

pending on seniority and overall responsibility

the North Is able to offer Obviously, using a wide choice of lent

### THE COMPANY AND MARKETON

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anviebla racord of success, both world-wide and in the UK, in the smell business systems field, and wishes to recruit a Regionel Menager to be based in Leeds.

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The rewerds for the succassful cendidate, in eddition to job setisfection end the opportunity for personal cereer growth, will include a removement to peckage of not less then £15,000, which for en outstending cendidete could be considerebly more, plus executive cer. BUPA. Pension and sickness benefits. If apprendicte relocation executive cer, BUPA, Pension end sickness benefits. If appro expenses will be reimbursed.

This is e very senior position and interested candidates should contect ivor Norton with full discussion. Complete confidence in the confidence of the confi errange en initiel discussion. Complete confidentislity is essured end no deteils will be disclos sed to our client without the express permission of candidates.

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Minimum of 18 months' CUBUL experience renecessery for this position. Applications era generally commercial, themselves of verying ability to work in their North-West. On-line, O SVS1 os menufacturing end linencial. Honeywall experience well experienced experience and energy ability to work in their North-West. On-line, O SVS1 os menufacturing end linencial. Honeywall experience well experienced experienced experiences are generally commercial. West installation. Selery is negotiable on disposition. Selery is negotiable on disposition expenses ere offered.

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As though this is not snough, they are also ambarking on fusther mini-computer projects, and some of the vaconcles described below are too development work on these new projects, utilising the minis and the 2900. The other vacencles are for the support, enhancement and redevelopment of a major 1900 system, which is also scheduled to go onto the 2900.

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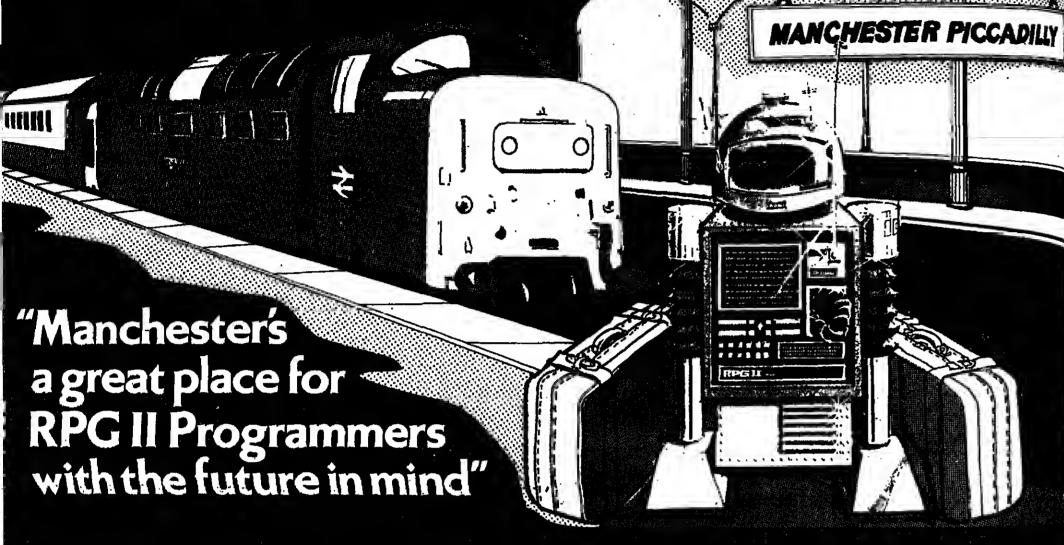
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They now require a Team Leader to control a team of Software Designers/Engineers and Software Programmers developing the specialised disk software for this new application. The successful candidate will be responsible for all aspects of the design and implementation of the software for both the hardware driver and the file manager.

Suitable candidates will possess in excess of 5 years experience in software development and have experience in 1/O software development, information retrieval techniques or database implementations on small machines, involvement in the setting up and controlling of a project team is desirable. Essential is a sound technical knowledge of software architecture and design and solid experience in an assembler level language,

Ideally candidates will be aged 25-35 with a degree and have the presence and ability to liaise with the various interface points both within the company and outside.

This is a rewarding and challenging role providing excellent career expansion and involvement in new areas of software and equipment using the latest techniques.

The company offers a good range of benefits which includes full relocation assistance if necessary.

To discuss this challenging new opportunity in more detail telephone Morley Holliday or write in strictest confidence quoting reference MGH 2122.



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The rapid growth of the Division has created the need for a Systems Engineer (ref CE/1) to provide specialist support to the field service force. He or she will have a degree in electronic engineering or computer science, followed by at least three years in a specialist support role with a mainframe manufacturer. This is an important new role within the Division, providing considerable career scope for an energetic and able individual.

#### Field Service **Engineer: Oxford**

We are looking for a Field Service Engineer (ref CE/2) to provide preventive and corrective maintenance at user siles in the Oxford area. He or she will have previous experience servicing computers and associated peripherals. An ONC or HNC in electronics or computing is desirable, but not essential. Whilst the position will clearly be of interest to engineers living in the area, relocation expenses will be paid should the successful randidate wish to take the opportunity to move to Oxford from elsewhere.

**Both positions** will attract an excellent benetits, and



Write or call, quoting the appropriate reference number: Eathy Martin. Data Logic Limited, 29 Klarylebone Road, Lourlon NW1. 101: 01-486-7288.

#### **UNIVERSITY OF SALFORD** Computing Laborators

#### **GRAPHICS PROGRAMMER**

support and distribution of the GINO-F peckage and associated satellite librates to 1900 and 2800 universities throughout the UK. The post involves a consist amount of travel within the UK and is littlelly lar a parled of t year but an extension to July 1082 is currently under review.

Applicents should possess e good honeurs degree and knowledge of major graphics package. Beorge II and George III ar 2800 experience and familiarity with university computing services desirable but not

Salary an ecals £3883-£6555 (undar review). USS supersnnuetlan Rai. CL / 63 / CW. .

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electronics services including microprocessor based systems. Applicants should have a degree in a relevent discipline and wide experience within the digital electronics field.

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Further perticulars and application forms available from the Registrar, University of Satford, Salford M5 4WT, to wham completed applications should be returned by 8 March, 1978, quoting appropriets reference.

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Based in the Treasurer's Department at Dorking this ie e Based in the treasurer a pepertment at porking this is a rare chellenging opportunity for the right person to lead the Council's Computer Taam. The present configuration is an ICL 2903 with EDS 80 Disc Drives, direct deta entry; line printer end card reader.

entry, line printer end card reader.
A large number of systems are being processed, with development of on-line enquiries now being undertaken: 37 hour wask with no shifter Removel and saitting in allowences would be peyebla if you have to move house.

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Junior and Sanior Operators with a minimum months' experience on any meinframe require urgantly. Listed bolow is a small selection of

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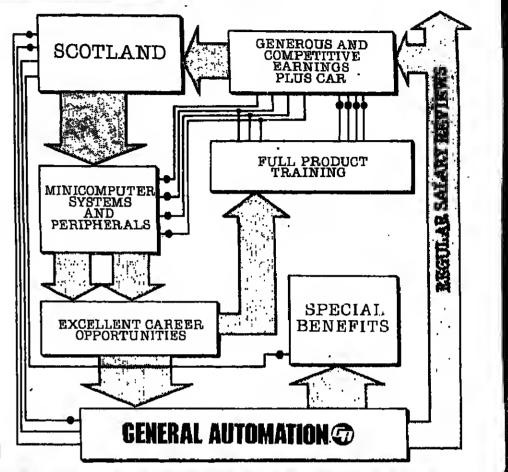
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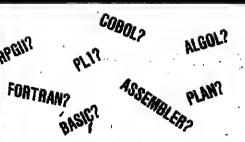
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Reference PG 9/1

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Reference PG 9/5

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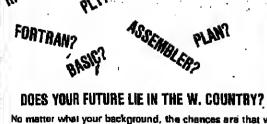
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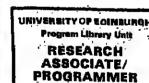
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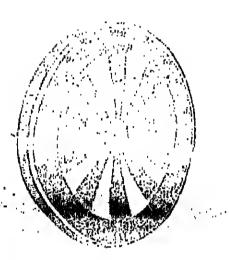


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#### For application forms please contect:

The Personnel Department, Council Offices, Duttone Roed, Romsey, Hempshire (Tel: Romsey 515117, ext. 42).

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#### STERLING DISTRICT COUNCIL FINANCE DEPARTMENT SYSTEMS ANALYST/ PROGRAMMER Salary scale: API/II £3,561 to £4,245

Applicents should have a good working knowledge of COBOL and experience of GCOS51 would be an edvantage. The auccessful applicant will be expected to assist in the design and implementation of new applications. The council operates a HONEYWELL 61/80 which will probably be repleced by a LEVEL 62/25 in the near

Applications quoting, ege, experience and names of 2 (two) referees to be forwerded to:
The Director of Finence

Municipal Buildings Sterling FK8 2HU

Not leter than 14th Merch, 1979.

Municipal Buildinge

D.M. BOWIE
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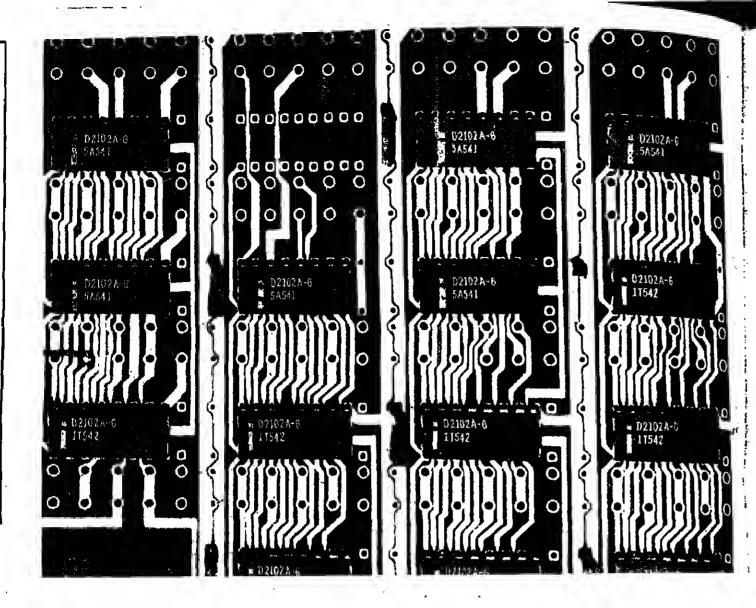
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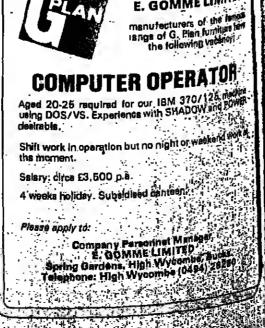
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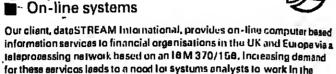
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Our client, a large and successful manufacturing organisation with a multi-million pound turnover are about to embark on their next stage of computer development. In order to ensure the affective implementation of this project within schedule additional Analyst/Programmers are required to join a

professional teem working to very high standards.

Although the company operate a farga IBM 370 mainframe, applicants with relevent experience on other manufacturers herdware are just as eligible as a mature approach and sound manufacturing systems knowledge are prime.

Successful applicants must posses a minimum two years COBOL programming experience together with a least one year's analysis involvement; in return for which ettractive career progression and company benefits are offered.

IBM OPERATOR FOR: TECHNICAL SUPPORT

SLOUGH £5,000-£6,000

A new position has recently been created with this busy Engineering Company, by the installetion of a new IBM mainframe. While several on-line application systems are currently being developed for the new machine a Technical Support Programmer is required to implement these systems on the new herdware. Working with OS JCL and COBOL the successful applicant will implement these systems, trouble shooting run time problems and generally tuning the performence of the systeme once asteblished.

Atthough COBOL experience is required training will be given since, in the first instance, indepth experience of IBM 370 operation and OS JCL are of prime

Company benefits, and conditions of employment are excellent, together with

potentiel to move into a technical apacialist role,

MYRIAD APPOINTMENTS LIMITED 30 Fleet Street London EC4Y 1AA

五

Recruitment



in Informatics

### Jnr/Snr/Mini/Micro Specialists **Denmark**

Salaries: £10K — £15K

Our client is the leading. Scandinavian Systems and Software Development Group recognised as Market Leaders In Its field. Owing to continued expansion in a wide variety of applications areas including Data Communications, Message Switching, Computer Networking and Mini Computer Software, a significant number of experienced career or lentated

personnel are urgently required. Emphasis will be placed on technical involvement and in depth experience in the areas of activity outlined above. Whilst a degree or equivalent qualification in either Computer Sciences or Mathematics is desirable, significant relevant experience will be considered in lieu. Of essence is a solld Assembler background within a Mini Computer or Microprocessor environment. Project locationa are primarily in Copenhagen and suburbs although candidates can work (should they so desire) in the Netherlands, Sweden or Germany, Of prime importance is demonstrable enthusiasm to relocate to Denmark for an extended period. Every assistance will be given in relocation including the cost of removal of all personal effects. initial accommodation expenses and a resettlement

interviews will be held as soon as applications are received and offers of employment will be made within 10 days of interview.

### **Analysts & Programmers** Inner/Greater Manchester

Our client is a major international Company recognised as market-leaders in its field and has retained Logistix to assist in recruiting the following key project team members — Real-Time Mini Programmers, Data Base Designers, Communications Programmers and Applications/ Software Programmers. Experience of any of the following will be especially welcome: RSX 11, RTL 2, Assembler, PL-1, COBOL, IMS DB-DC. For those who enjoy overseas travel there will be ample

opportunity to work at the company's E.E.C. offices in Sweden and the Benelux.

Successful candidates must demonstrate qualities of leadership potential, determination and be self starters. It is expected that all stall should have the ambition to achieve Project Management status

Interviews will be held at one of the company's three CIK offices most convenient to the candidates

### **RSX 11 Programmers Netherlands**

Salaries: £10K - £15K Many of the forefront developments in Mini Computer Soltware and Data Communications are emanating from Europe and if you aim to move into

frontier technology the opportunity arises to join a highly reputed Systems and Software Development group engaged in prestiglous projects in the areas of Data Communications, Message Switching, Networking and Process Control. Existing and new project teams require Consultants,

Systems Designers Senior Analysts, Analyst/ Programmers and Programmers with relevant experience in at least one of the above areas of activity. In particular, extensive Mini Computer Assembler experience is essential. Successful candidates are likely to be aged between 22 and 35 years with a degree or equivalent (Computer Sciences or Maths) or extensive relevant experience

You will most certainly contribute valuable expertise to this industrious group whilst expanding your own threshold of experience through working closely with other professionals at your own level. Our client will pay full relocation expenses for you and your family and provide a generous resettlement advance in addition to meeting the costs of temporary accommodation pending location of permanent housing. Numerous other benefits contribute to make this a very altractive

Numerical Analysis, Image Processing and Operational Research. The scope and involvement

mid and late February and offers will be made by the

### Scientific Programmer Italy

Salary: £10K - £12K THÉ CLIENT: A multi-national Research and Development Institution is further expanding its team strength in the areas of scientific project Implementation and requires several permanent scientific Programmers with Mini Computer Assembler or Fortran experience. Incidentally, we particularly wish to speak to candidates with current

currently being developed for implementation in the early '80's. Specialist skills in the areas of one or more of the following are especially useful:

of these applications is likely to be both challenging and interesting and is certain to push the horizon of technical sophistication to the limit. THE PACKAGE: in addition to a very realistic salary or very recent HP 2100 Involvement.
THE APPLICATIONS: A wide variety of projects is the company also provides full relocation expenses, medical inaurance and pension schemea as well as initial paid accommodation expenses for you and your family. Interviews will be held in London during

### Small Machine Programmers Central & N.W. London

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A European manufacturer of V.R.C. and Office Business Systems seeks aeveral additional Programmers and Systems Analysta who will be engaged in developing aeveral new challenging commercial applications. The opportunity also exists to develop into (BM mainframe projects at a

Suitable applicants must have current experience of writing Programs primarily in BASIC and secondly Business Assembler within the environment of a

Software house/turnkey supplier or manufacturer. Particular hardware experience la much less Important but generally knowledge of Klenzle, Nixdorf,Ollvettl or Philips is significant.

Salaries are above market rates and in addition to a comprehensive range of Company benefits including contributory pension scheme, sickness benefit, Project bonus and 4 weeks annual holiday, interviews will be held in London in February and

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# SYSTEMS ANALYST

NORTH LONDON

The appointment is for a systems analyst with a good background in commercial data processing, preferably within a manufacturing environment. Candidates should have at least two years in systems analysis and previous programming experience.

Application areas of particular interest are financial, order processing and stock control where current methods are to be replaced with on-line systems. The installation is a Univac 90/30.

Our client is a major manufacturer serving the construction Industry with a comprehensive range of nationally known products. The position is open to someone seek ing a real involvement over a wide variety of tasks within the company's computer department. Location is North

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We require engineersable to perform the top down design leading to definition of software requirements for air defence, communications and command and control systems. This involves total software responsibility from conception to implementation, and the ability to document performance requirements in accordance with military documentation.

standards such as MIL-STD-490 for B5 software applications. Experience must include a minimum of four years in a major. UK aerospace or defence confracting company, and a relevant

Attractive starting salaries will be accompanied by generous relocation assistance for you and your family to the US. Interviews will be held in London in the near future.

If you are interested in exploring these opportunities in strictest confidence, write, or, better still. strictest confidence, write, or, petier, survey to the lephone, quoting Reference No. 8186,10 telephone, quoting Refere Tel: 01-836 1500.

MANAGEMENT SELECTION

All classified copy should reach our offices no later than \$ 30 pm supplied 12 noon on a Tuesday.

ing David Abbey for further details on 01-261 8015.

# We're successful because our staff are

Data Logic operates at the forefront of computing, applying the very latest hardware and techniques to practical commercial problems. We cover the range from mainframes to the smallest computers. We are leaders in the use of microprocessors for applications that not so long ago required far larger machines. Several of our projects involve dispersed networks of ten or more

The exceptional scope of work is important to our staff. We can match their individual experience to their projects. Equally, we can ensure that each project adds to their experience. As

computing itself develops, so do they.

Over the past year Data Logic has grown dramatically in size, in scope of work and in reputation. Our expansion has meant unrivalled opportunities for career progression. We are not prepared to promote people before they are ready for it. But when they are ready — and we give all the assistance we can — the positions as senior programmer, senior analyst, project manager and consultant will be there waiting for them.

The reason is simple. We know that we are successful only if our staff are.

#### Senior Software Staff

(Ref PS/01)

for mainframe, minicomputer and mixed processor systems, usually supporting terminal networks. Increasingly Data Logic's turnkey projects involve minicomputers at multiple sites.

Applicants must have at least five years experience including some work in consultancy, system design or leam management. Substantial knowledge is required of either high level language implementation on a leading mainframe or assembler language development on DEC, Data General or other leading minicomputers. We are especially interested in experience of:

- database systems
- distributed systems
- data communications lelemetry

implementation. Salaries will be up to £8,500, with a car allowance or company car for those at the lop end of the scale,

operating systems design and

There are vacancies at our Greenford, Birmingham and Manchester offices.

### **Programmers**

(Ref PS/02)

For both mainframe and minicomputer projects which include commercial applications, monitoring and control, and scientific analysis.

Applicants should have at least three years programming and/or analysis experience in high-level language or assembler on any leading mainframe or mini, Salaries will be in the range of £4,500 to £6,500.

Vacancies exist in our Greenford, Birmingham and Manchester offices.

#### Data Communications Support Engineers

(Ref CP/01)

For sales and engineering support roles within **Communications Products** Division which markets the INTERTEL range of modems and Network Control Systems.

Applicants should have experience either in sales support for data equipment or in design for digital and analogue systems. A degree or HNC qualification is desirable.

Base location will be in Central London but high mobility will be essential and a car will be provided. Salaries will be in the region of £6,500.

#### Systems Support لَا الدَّهُ الْ

(Ref CE/4)

For specialist support roles within our Customer Engineering Division, which provides nationwide field service for terminal and distributed systems, word processors and data communications equipment. The support staff deal with hardware and software, within a diversity of user environments. Each product represents the state-of-the-art in its area.

Applicants should have a degree in electronic engineering or computing science, followed by at least three years work in specialist support with a mainframe manufacturer,

Base location will be Harlow. Essex but high mobility is essential and a car will be provided.

### Programmers

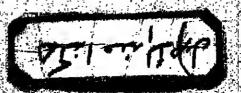
(Ref TS(0.3)

To work on systems software, emulators and arlvanced packages for applications such as data entry, for Data Logic's PTS100 range of terminal and distributed systems. This is an outstanding opportunity to gain experience in the development of complex high performance standard software. Programmers will work in small teams, taking considerable responsibility for distinct functional areas of the total

Applicants should have one to three years experience of software implementation in high-level or assembler languages. A degree in computing science is desirable.

Location will be Harlow. Essex and salaries will be in the range of £4,500 to £6,500.

Write or call, quoting the appropriate reference: Kathy Martin, Data Logic Limited; 29 Marylebone Road, London NW1. Telephone 01-486 7288.



COMPUTER WEEKLY, March 1, 1979

'Rubber' figures

### STRATHCLYDE :

**GLASGOW Sub-Region** 

ROADS DEPARTMENT

#### **SYSTEMS DEVELOPMENT OFFICER**

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These selery rangus ere inclueive el supplement

Application farms for Glasgow Sub-Regioe posts may be obtained from The Assistant Director of Maspower Services. 21 Gerdon Street, Glasgow G1 3PS, to when completed forms, quoting apprepriate Ref. No. should be returned by 18th Merch, 1576.

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### ANALYST/

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Honlin Board Roay House, 1 Old Edinburgh Road, Investigati not loter than March 9, 1979

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is able to compensate for

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eclurers required to give

long-term forecasting there is a need to take into Each course 1 or 2 days I langth with full consultance account the effect of both technological advancement

and competitive products. Correlation analysia keting of one product may

> punch cards. precise form of correlation stitution, 2 Park Street, where the sales of one product is a direct function of 629 9000.
>
> the sales of enother; for example, floppy discs and cortridges are virtually dependent on the number of THE Cheltenham-besed

Within the context of

sold.

The epplication of some or all the methods of enalytical and mathematical foreoasting mentioned in this and tast week's column should eventually bring the sales manager to a sales forecast which he believes is o fair (feir/reasonable not feir/moderetel) assessment

o fair (feir/reasonable not feir/moderatel) assessment of likely sales achievoment. Scottish HO for the coming year.

That is the externel of CMC is now at 18 Atholic orecast. The other internal, of CMC is now at 18 Atholic opposing and just as created. Edinburgh, Elis necessary forecast, is a SHQ Tel: 031-229.7331, composite judgment of what is possible in terms of sales and production. This is achieved by creating the achieved by creating the amalgam of customer, sales, production, and manage ment opinion already dis-cussed earlier on this topic. The two forecasts should

then be compered. They will seldom be the same but any

mean loss of credibility

cussing the need to take cate o contradiction two differing approaches to somewhere which needs to the generation of the sales be resolved forecast — an externel one which is besically mathe-The oppronch provides three significant benefits: I. It checks the necuracy of metical end sn internal one which is on the basis of in-

the original sales forecast; 2. t crystallises the judgment We then discussed the and considerations of sales relative merits of seles forecusting hy extrapolavolves all those people who tion and the use of moving will be called upon to accept nnnuni totals - although the commitment implied by moving periods such as the forecast. quarterly totals might in Of course, the sales

some situations be preferforecast is in itself only a In some ways the smortthing effect of the moving costs which will be mided in annual total tends not only other company costs in to iron things out but nise order to assess the profit press things in. This partiforecast which is really the cularly applies to identiff-

able and non-recurrent ex-One personal feeling on ceptions or short-term the subject before closing No sules manager worth his For Instance there may salt, having committed have been a period, of say himself to a sales forecast six months, in a previous will, in my opinion, scrap it year when sales within a and replace it with some computer burean were rest- artificial figure, which ricted due to the overdue neither he not his people delivery of an additional believe in just because the computer. There may also mumber in the best on have been variances due to right-hand corner of the economic influences. Ex- company longer doesn't ponential smoothing is a please the managing direcmathematical device which tor.

Reduce other company these kinds of special costs, take on the challenge of revenue over ond above If you went to get really the coll of duty by nil means, elever, then it is possible to but stick to the original use eigebraic methods for forecast

evaluating the effect of one There's no better way of varience upon another, losing credibility with one's namely regression analysis, subordinates or superiors but I never got that than dealing in "rubber" aales forecasts.

TRADER

### Jargon book

THE British Standard glossary of terms used in takes into account the pos- date processing has been sible effect that the mar- published by the British Standards Institution. It have upon another - for contains the terms and deinstence, the influence of finitions of data media. key-to-dlac systems on storaga end related equipment, and is everlable from Tied indicators are a very the British Standards In-

mini end microcomputers mekars of data logging and computer peripheral equip

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# Ascii through the Logic Gato

An epic in 32K words, by Richard Forsyth

#### Block 28 (Ivory Tower Block)

Cleo's exploration of the disused mercury mine has led her deep into trouble. She has follow through the ventilation shoft of an dinental loboratory hewn out of the rock.

SHE looked around her. The pince was fitted out like an alchemist's den. A stuffed erocodile hung by chains from the celling. Its sharp teeth glinted in the pallid artificial light. Round the walls, like a big game hunter's trophies, were mounted the heads of various exotic apecies, mostly herblyores such as elks and antelopes, though she spotted a black pums and a snow lenpard among them. Here and there on the shelves she could see, pickled in jars of yellowish preservative, what she took for animals' brains. The foetid smell of formaldehyde pervaded the air. She had upset a bottle when she hoded and the liquid was oozing

At the far end of the laboratory, to her right, an android bad pid down the retorts and phlais he had been busy with and was eyeing her with curiosity.

"Aha!" he exclaimed, Jurning off his Bunsen hurner. "Just what I want for my cross-breeding experiments — a human female of childbearing age!"

Chep didn't like what she heard. He begun walking towards her. She noticed first his style of dress. Eschewing the lift worker's sterile white cont, his gurb was the epitame of trendiness. His pale lemon kaftan was patterned with intricate Arabic calligraphy, and unbuttoned at the top to reveal a grizzled expanse of chest hair. Against this virile mattress some sort of runic pendant hung on a leather thong round his neck. Hip-hugging jenns clung modishly to his middle-nged spread.

He stopped before he reached her and opened a refriger-

ator. In among the racks of blochemical specimens was a six-pack of beer. He pulled out two cans and handed one to

"Here," he said, popping open his can, "have one." Cleo gratefully gulped down the ice-cold luger. He took a couple of swigs and then usked: "Who are you? I'm Mike Rose, Director of the Meta-Physical Laboratory."

"Well Cleo, if you will just finish off your drink and come this way, I'll show you what you have to do, it shouldn't take long; and it won't hurt a bit,"

His pollshed bedside manner was at once so affable and

"Actually this is Neddy (short for Neonderthal), Pitt-down's clone," explained Rose, "We always keep a spare

drew aside.

in a minute," he told her.

Imperious that it had a meameric quality. She found herself involuntarily following him. He led her down to the other

end where there was a little cubicle with a curtain which he

"Just step in here and take off all your clothes. I'll be back

Meckly, without question, she went inside, almost

watching herself as a spectator. His steps gradually rec-

Cleo peeped out. At the other end of the lab, Rose was

"Pilldown!" she exclnimed in surprise and delight.

running out though she was half naked,
"You're acquainted, then," remarked Rose mildly,
"Of course," she replied, "It's Piltdown, But he can't be

eded. There was the sound of n latch being litted.

holding the door open to let in his assistant.

He smiled down, hardly seeming a stranger.
"Now then, shake hands," Rose sald, "Cleo meet Neddy Bigfoot, Neddy, this is Cleo."

Pleased to meet you," said Cleo.

"Bonnn tugon," replied the ape. "He still speaks Esperanto," said Cleo. "Why doo't you

"Too filogical," explained Rose. "He's more at home in joure third-order Predicate Calculus anyway; but I find it hard to keep up with him. Esperanto is a concession to my frailty: it's the least methodical language I can permit him to learn without polluting his mind with human values."

"But I can't talk to him," complained Cleo.
"Oh you'll get along fine without it, I can see," Rose answered, "which is a pity in a wny because I shall now have to abandon my plan to form a hybrid by mating human with Susquateh."

Cleo listened with relief. Rose was beginning to seem

"Yes," he continued. "I'm afraid you're no use to me. You're pregnant already.'
"What?!"

"Don't worry. I can tell before you can — less than seven days after the event. I only need one look. I'm the world's

"Impossible!" she expostulated.

"Wait and see," he replied calmly. "Time will tell." "But, I mean . . . I thought androids couldn't . . . "

Rose raised his eyebrows. "An nudroid father, eh? Now you've got me interested again. Some of us can, you know, in the old days all they kept for cybernation was the brain and spinal cord; but modern thinking is that it's more economical to leave must of the vital organs intact."

Cleo blushed deep searlet, "You'd better go and put your clothes on again," sugg

While she was in the cubicle dressing, Rose called over: "Bigfoot will show you around while I decide what's to be

When she emerged the great ape licekoned and she went out through the door after him. She found herself on a metal halcony riveted into the rock. They stood at the edge of one of the cativniks that crossed and criss-crossed the vust subterranean cavern. She looked down at a hive of industry beneath. Automata of all descriptions (finite, deterministic, non-deterministic, pushdown and linearhounded) searried purposefully to and fro across the floor of the cave like unts, bathed by arc-lights from the vaulting roof. The whole place buzzed with incessant activity.

"Granda," she replied, "yes," Her mind was not on the busy workers scuttling below. She was thinking of the unborn child in her words, wondering whether it would ever see the light of day, and, if so, how sho would cope

is this new trurdon too heavy for her? Buck to Hex next week



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